EUROCONTROL
Products & Services Catalogue

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CONSORTIUM COORDINATOR sesar DEPLOYMENT MANAGER
FOUNDING MEMBER sesar JOINT UNDERTAKING
NETWORK MANAGER

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INTRODUCTION

EUROCONTROL is an inter-governmental, pan-European and civil-military organisation dedicated to supporting European aviation. EUROCONTROL's expertise spans research, concept development, Europe-wide project implementation, operations and performance. It is committed to the European Union's vision for a Single European Sky. It supports its 42 Member States, 2 Comprehensive Agreement States and a wide range of stakeholders in a joint effort to make aviation in Europe safer, more efficient, more cost-effective and sustainable.

EUROCONTROL provides **customised support to EUROCONTROL Member States and Stakeholders** in accordance with the Support to States Policy approved by its Permanent Commission and other relevant arrangements. EUROCONTROL offers multiple products (tools, models, webinars, training and services) to support the work of ATM stakeholders across Europe and also globally.

This document provides an overview of all the products & services offered by EUROCONTROL.

EUROCONTROL States[1] can have free-of-charge access to a wide range of these tools and services and are also entitled to obtain assistance under the conditions established in the Support to States Policy. In other cases, the products and services offered may be chargeable. Furthermore, not all tools and services are available to all the stakeholders.

Chapter 3 describes the various contact points at EUROCONTROL.

In this catalogue reference is made to "beneficiaries" and "availability". These terms are defined as:

- Beneficiaries: suggested entities that could benefit from the services & products listed in this catalogue or are already using them.
- Availability: geographical regions in which the service or product can be made available. Certain services or products are, however, not available in all regions.

More information about EUROCONTROL can be found on our public website: www.eurocontrol.int

1 The 42 Member States, plus Morocco and Israel as Comprehensive Agreement States.

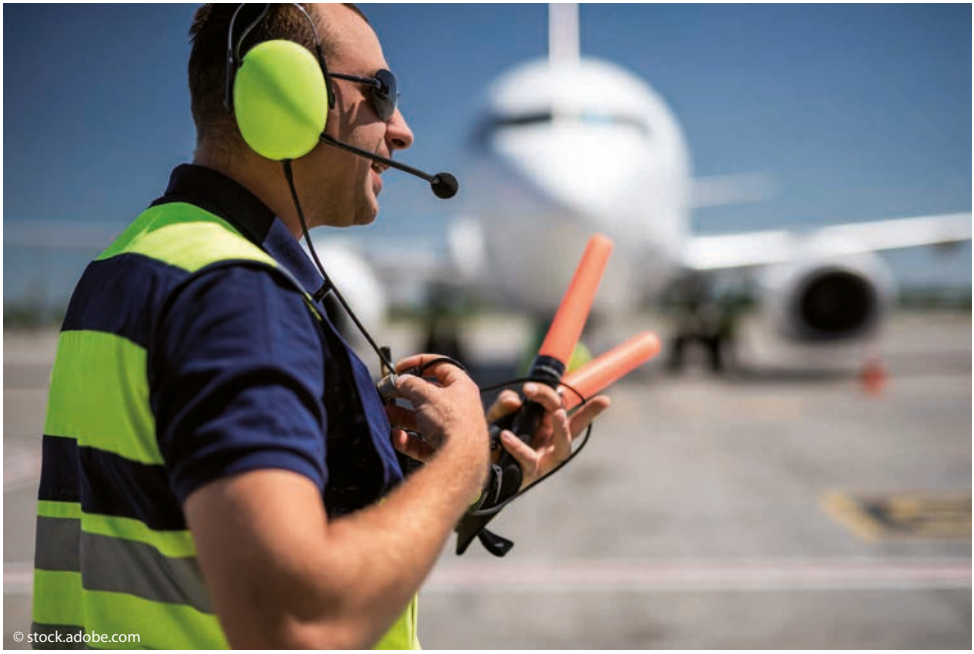
CONTACT POINTS AT EUROCONTROL

All inquiries regarding the products and services featured in this document can be addressed to:

- EUROCONTROL Member States: Please contact Support to States Programme (STS): Email: sts@eurocontrol.int
- Other entities: Please contact Business Coordination Service (BCS): Email: sales@eurocontrol.int

Where the offered products and services are subject to charges, EUROCONTROL can provide a price offer, provided you are eligible to use the specific product or service.

Please note that access to certain products and services may be restricted due to Agency rules, EU regulations, or civil-military (CIV-MIL) considerations.



1// AIRPORTS

Learn more about our activities here:

https://www.eurocontrol.int/airports

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1 Airport Capacity and Performance (ACAP) Assessments

Service/tool description

The Airport Capacity and Performance (ACAP) service supports Stakeholders with analytics and expertise to quantitively and qualitatively assess and enhance airside capacity. It reviews baseline operations and project on throughput increase, with a set of recommendation for the short, medium and long term. It can be optionally complemented by landside process evaluation and ATC human factors assessment.

Airside operational assessments

This type of assessment, based on traffic data analysis, provides a snapshot of airport airside operations during a reference period/season. It mainly focuses on arrival and departure runway throughput, complemented by taxi-in/-out interactions.

Airport capacity assessments

Based on the operational assessment, this more in-depth activity further projects the optimal runway throughput values and a set of recommendations to improve operations. It builds from both quantitative and qualitative evaluations and can be optionally complemented by landside process analysis and ATC human factors assessment.

Enhancing airport performance to improve network predictability

EUROCONTROL also supports neutral airport performance assessment based on network data, covering local airport, ATC and airlines scope. The output focuses on identifying performance challenges and proposing related mitigations for improving use of existing infrastructure, future plans, communications between stakeholders, and inspiring from best practices existing in Europe.

Continuous Capacity and Performance Monitoring (CCPM) Application **(see page 12)**

This web-based application provides 24/7 capacity and performance monitoring, based on the concept of an automated data collection.

For more information: https://www.eurocontrol.int/service/airport-capacity-and-performance

Beneficiaries ANSPs, Airports, Private Entities, Others

Availability Worldwide

Product code 2P0101

2 Advanced Network Integrated (ANI) Airport

Service/tool description

Advanced Network Integrated (ANI) Airport – Implementation of AOP-NOP Integration.

Sharing the content of an airport's operation plan with EUROCONTROL's Network Manager is a key step in having a complete picture of the expected traffic situation.

At EUROCONTROL, our goal is to establish a common, bi-directional data exchange between airports and the network through our system-wide information management (SWIM) concept. Thus, EUROCONTROL and SESAR Partners have developed the Collaborative NOP concept to further connect airports to the network.

Our efforts are in support of the Commission Implementing Regulation (EU) 2021/116, section 4.1.4. Such legislation requires EUROCONTROL, in its capacity as Network Manager, to establish a collaborative NOP with exchange of information from the operation plans of the main airports (AOP) in the NM area into the Network Operations Plan (NOP).

With the Collaborative NOP and AOP-NOP integration, airports share operational arrival and departure planning information earlier (beyond the current A-CDM process) with EUROCONTROL. This helps to optimise predictability thus helping airports with limited runway capacity and enhancing network performance.

For more information: www.eurocontrol.int/concept/connected-airports

Beneficiaries ANSPs, Airports, Private Entities, Others

Availability Worldwide

Product code 2P0102

3 Airport Collaborative Decision Making (A-CDM)

Service/tool description

Airport Collaborative Decision Making (A-CDM) – Implementation and Performance Assessment Solutions.

A-CDM aims to improve the efficiency and resilience of airport operations by optimising the use of resources and improving the predictability of air traffic by encouraging the airport partners (airport operators, aircraft operators, ground handlers and ATC) and the EUROCONTROL Network Manager to work transparently and collaboratively, exchanging relevant accurate and timely information. It focuses especially on aircraft turn-around and pre-departure processes.

At EUROCONTROL, we support the implementation of A-CDM to help the exchange of more accurate departure information, particularly target take-off times, with the European ATFCM network, leading to improved en-route and sectoral planning.

For more information:
www.eurocontrol.int/concept/airport-collaborative-decision-making

Beneficiaries

ANSPs, Airports

Availability

Worldwide.
Exchange with Network Manager is limited to EUROCONTROL Member-States.

Product code

2P0103

4 Advanced ATC TWR

Service/tool description

For smaller airports where there is no justification for a full A-CDM implementation, the possibility to integrate with the ATFCM Network is offered by the Advanced ATC Tower concept, sharing a very small sub-set of A-CDM information with the network. This option is also available to those airports that want to take a step towards full A-CDM.

For more information:
www.eurocontrol.int/concept/airport-collaborative-decision-making

Beneficiaries ANSPs, Airports

Availability EUROCONTROL Member States

Product code 2P0104

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5 European Connection of Regional Airports (ECRA)

Service/tool description

The ECRA service enables the basic NM connectivity that fills the small and regional airport predictability gap. It reduces the so-called "black box effect" at airports with limited surveillance. It integrates the Airport with the ATFCM Network (as expressed in the Advanced ATC Tower concept), through a web-based system designed for sharing a very small sub-set of A-CDM information with the network.

The service incorporates two major processes:

1. Automatic provision of Departure Planning Information (DPI) messages from small/regional airports, generated upon ADS-B data events and replacing the information gathered manually (or from unverified sources). When the information is exchanged with the Network Manager, it improves traffic demand predictability.
2. Provision of most recent information for IFR traffic at an airport, including the impact that other airports may have on a particular flight. The airport-centric view enhances situational awareness by providing network-sourced data that supports the optimal use of airport infrastructure and helps meet passenger expectations for punctual travel.

EUROCONTROL supports the delivery and integration of the service and guides the users through the whole implementation process.

The user group – the Connected Regional/Small Airports Task Force (CRSA TF) – secures the support for standardized deployment of current and future functionalities.

Beneficiaries ANSPs, Airports

Availability EUROCONTROL Member States

Product code 2P0105

6 Continuous Capacity and Performance Monitoring (CCPM) Application

Service/tool description

This application provides the main airport stakeholders with a comprehensive post-operational view through a continuous (24/7) capacity and performance monitoring of flights tracks, enriched with NM data.

The application is based on the concept of an automated airport traffic data collection for which the airport stakeholders need to provide the application with ADS-B or local ground surveillance data.

The application provides automated calculation of indicators such as arrival and departure throughput, runway occupancy time, traffic mix, taxi-in time/distance, taxi-out time/distance or stand occupancy statistics.

The application is a highly recommended enabler for detailed quantitative air-side operational/capacity (ACAP) ACAP assessments.

For more information:
www.eurocontrol.int/service/airport-capacity-and-performance

Beneficiaries ANSPs, Airports, Aircraft Operators and CAAs

Availability EUROCONTROL Member States

Product code 2P0106

7 Surface Management Deployment Support

Service/tool description

Airport surface operations (gate-runway-gate) are increasingly complex. EUROCONTROL offers support to airports and ANSPs to understand the latest developments of advanced surface movement guidance and control systems (A-SMGCS), surface and runway safety nets and new capabilities, such as follow the greens. We also provide A-SMGCS Specifications, guidance material, a prototyping platform and operational expertise.

Support includes knowledge transfer on the latest capabilities, joint projects to define updated procedures and future controller working position designs, as well as the use of our tower simulation capability.

For more information:
www.eurocontrol.int/service/advanced-surface-movement-guidance-and-control-system

Beneficiaries ANSPs, Airports

Availability Worldwide

Product code 2P0107

8 Runway Throughput Solutions – Deployment Support

Service/tool description

The EUROCONTROL Runway Throughput Package proposes a set of operational solutions, based either on procedural, light or advanced automation, to integrate controller support tools, and addressing factors such as wake vortex separation, headwind, separation delivery performance or runway occupancy time spacing. The package includes variants of:

- RECAT EU / PWS guidance on optimised wake vortex separation minima covering ICAO wake turbulence groups through to pairwise minima.
- ROCAT (Runway Occupancy Time Categorisation), guidelines on optimised runway spacing with best practice in runway management; and reduced radar separation with focus on airports with a significant medium type aircraft category.
- TBS (Time-Based Separation) on final approach: guidelines on an operational solution, which uses time instead of distance to separate aircraft on their final approach to a runway. In order to apply this concept, approach and tower air traffic controllers need to be supported by a separation delivery tool which displays a distance separation indicator (final target distance – FTD) corresponding to the applicable TBS minima and taking in account the aircraft speed and prevailing wind conditions.
- ORD (Optimised Runway Delivery), guidelines on a separation delivery aid which improves separation delivery performance when providing a second spacing indicator, namely the Initial Target Distance (ITD). The ITD ensures optimum runway delivery (ORD) by showing expected com-pression between traffic on final due to the natural catch-up and the difference in final approach speeds. Such a tool, beside enabling the application of TBS, improves ATCO delivery conformance and performance, while maintaining or even reducing the associated ATCO workload, and also allowing the application of complex business (separation/spacing) rules.

These solutions can deliver up to 15% increase in arrival runway throughput, depending on the airport traffic mix and reference baseline.

For TBS-ORD, COAST (Calibration of Optimised Approach Spacing Tool) is a service to ANSPs and their Approach and Tower ATC system Provider(s), that uses Machine Learning techniques for higher accuracy on aircraft behaviour prediction, trained from historical surveillance traffic and MET data, supporting more efficient calibration of a separation delivery tool. The models, once integrated into a separation delivery tool developed by the ATC system provider, allow the computation of the optimised separation and spacing indicators, and improvements of separation delivery (up to around 5% throughput increase, even without effect of headwind).

Service/tool description

COAST also supports regular updates of the models in order to cover progressively the complete traffic fleet and also to cope with new aircraft and operational evolutions, reducing the efforts and facilitating the calibration 'maintenance' of the TBS-ORD tool.

For more insight, read our White Paper:
https://www.eurocontrol.int/publication/eurocontrol-coast-calibration-optimised-approach-spacing-tool-use-machine-learning

The deployment support covers knowledge transfer to develop local operational and technical specifications based on EUROCONTROL guidance material, generic safety cases and data analytics, as well as deployment advice based on experience with different stakeholders.

For more information: www.eurocontrol.int/airports

Beneficiaries ANSPs, Airports

Availability Worldwide

Product code 2P0108

9 Airport Corner (Airport Network Digital Data Centre)

Service/tool description

To support the effective management of the European ATM network, the Network Manager (NM) regularly captures airports information. The data received from airports is used to improve planning and operational processes and effectively manage the European air traffic management network. To enable airports to provide information in an efficient and harmonised manner, NM provides the Airport Corner service, an airport focused data repository supported by a secure web application. The application enables information provision from European airports to NM and to the network (airspace operators, other airports, ANSP…) at any time.

The underlying process facilitates collaboration between the local ANSP and Airport Operators resulting in a "coordinated airport view". The information scope covers a wide range of information from strategic, pre-tactical, tactical operations to post-operations and enables real time sharing between airports, NM and airlines, providing customisable subscription services and making the information available via a number of dedicated interfaces. The information scope can be easily expanded to attend to new business needs.

By regularly providing information via the Airport Corner, airports can comply with the obligations stated by the Commission Implementing Regulation (EU) 2019/123, the EU Regulation 255/2010 ("Laying down common rules on Air Traffic Flow Management") as well as some specific requirements stated by the Commission Implementing Regulation (EU) 2021/116 - Common Project One (CP1). By regularly providing information via the Airport Corner, airports can comply with the obligations stated by the Commission Implementing Regulation (EU) 2019/123, the EU Regulation 255/2010 ("Laying down common rules on Air Traffic Flow Management") as well as some specific requirements stated by the Commission Implementing Regulation (EU) 2021/116 - Common Project One (CP1).

For more information:
www.eurocontrol.int/tool/airport-corner

Beneficiaries NM, ANSPs, Airports, Airlines

Availability Worldwide

Product code 2P0109

10 EUROCONTROL Wake Knowledge Factory (EWKF)

Service/tool description

The EUROCONTROL Wake Knowledge Factory (EWKF) is wake platform, which automatically compares the recorded local wake behaviours with the wake databases used in the generic safety cases and then confirm the suitability of the associated separations.

Concepts like RECAT and Time-Based Separations allow wake separations to be reduced and this leads to increased runway throughput.

These separation reductions have been validated by safety cases which were developed by EUROCONTROL and then reviewed and endorsed by EASA. They were based on extensive wake measurement campaigns carried out at various European airports. Even if these concepts can and have been deployed without additional local wake measurements or for supporting validation of new wake related concepts, the national ANSP or local regulation authority can require additional evidence that EUROCONTROL's generic safety case can be applied to their specific local conditions. This can be done by deploying a LIDAR system to measure wake vortices generated by arriving and departing aircraft. However, the post-processing of the LIDAR data and merging this data with traffic data can be an extremely complicated and time-consuming process. EUROCONTROL has developed a platform that automates this process. It uses quantitative monitoring throughout the data collection campaign and incorporates stringent quality controls. These features make for a clean database which can then be used for advanced analyses.

For more information: www.eurocontrol.int/project/airside-airport-and-runway-throughput

Beneficiaries ANSPs, Airports and ATC System Providers

Availability Worldwide under a licence agreement

Product code 2P0110

11 Passenger Demand Prediction

Service/tool description

The service for Passenger Demand Prediction aims to support airports to manage the high volatility of traffic and subsequent passenger demand and can support airport operations planning, by predicting passenger demand, anticipating issues and enabling enhanced staff planning.

This support service has been developed using machine learning principles through monitoring of commercial flights i.e seats offered in the market, true intent search data, etc. Complementary features such as day of the week, time of the day, airline ID, or airport ID are also used to further support the passenger demand prediction accuracy.

The service provides users with different information views that are linked to predicted number of passengers, flights, and even cancellations. Primary objective is to provide users with the opportunity to anticipate trends in passenger volumes, which further supports operational planning and on-time performance on the day of operations linked to smooth passenger handling process. This service is available through a Power BI dashboard, and daily prediction outputs can also be retrieved through Network Manager (NM) B2B Services.

For more information:
www.eurocontrol.int/dashboard/passenger-demand-support-service

Beneficiaries Airports

Availability European Airports

Product code 2P0111

12 Landing and Take-Off (LTO) Cycle Emissions Estimator

Service/tool description

The Landing and Take-Off (LTO) Cycle Emissions Estimator allows users to quickly and easily access estimated fuel consumption, CO2 and NOx emissions related to aircraft operation on the ground and in the vicinity of airports up to 3,000 ft above ground level.

The tool was developed by EUROCONTROL to assist stakeholders in assessing the impact of flight operations on emissions, and to support their reporting for both voluntary and legislative emissions reduction programmes. The tool covers all the airports in the EUROCONTROL area. All Airport Corner users from Airport Operators and ANSPs have automatic access. Users can access their own data for their respective airport(s), which is updated on a daily basis and contains five years of historical data.

The LTO EE is based on the work done by EUROCONTROL on the Fuel Burn and Emissions Inventory System (FEIS) procedure. The LTO EE improves the FEIS procedure by using the best available data on taxi times, automating the process and making the statistics available to external stakeholders in a timely manner. Network Manager's flight data is used together with different engine databases, including ICAO Aircraft Engine Emissions Databank. Airports integrated with the Network Manager (i.e. AOP/NOP, A-CDM and Advanced ATC TWR airports) benefit from early availability of precise taxi time data per individual flight, thereby improving the accuracy of the estimates.

For more information: www.eurocontrol.int/tool/landing-and-take-cycle-emissions-estimator

Beneficiaries Airports, ANSPs, CAAs, NM

Availability EUROCONTROL Member States

Product code 2P0112

2// SAFETY

Learn more about our activities here:

www.eurocontrol.int/safety

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1 Toolkit for ATM Occurrence Investigation (TOKAI) and the Risk Analysis Tool (RAT)

Service/tool description

The TOKAI and RAT are essential safety tools enabling users to report, investigate and take corrective actions following incidents and accidents, known as occurrences.

Via TOKAI, users (in particular ANSPS) collect, investigate, store and analyse occurrences. The tool allows its users to replace many legacy systems (inc. paper-based systems) and adopt modern electronic tools. It is ideal for use in operational, engineering and support environments.

The RAT is one of several tools in the TOKAI's tool suite. It implements a methodology that has since been adopted into the EU legal order and EASA. CANSO Global decided in 2016 that all its member ANSPs should adopt TOKAI/RAT tools. More than 80 users worldwide currently use TOKAI and RAT. TOKAI can also export data in the ECCAIRS format, which is used by ICAO for its Annex 13 and Annex 19 reporting obligations. The tools is flexible enough to allow a seamless use by any organisation, regardless of its size and complexity.

For more information on TOKAI: www.eurocontrol.int/tool/toolkit-air-traffic-management-occurrence-investigation

For more information on RAT: www.eurocontrol.int/tool/risk-analysis-tool

Beneficiaries NM, ANSPs, CAAs, MET/AIS and ATM Data providers, Airports and Airlines

Availability Worldwide

Product code 2P0201

2 Automatic Safety Monitoring Tool (ASMT)

Service/tool description

ASMT is EUROCONTORL's unique tool that monitors safety performance and supports the identification of systemic issues and operational risks.

ASMT is designed to accomplish multiple objectives in the complex field of air safety management to support the enhancement of the safety of the overall ATM system. The information obtained can help ANSPs gain a broader and more objective perspective of current safety issues, such as airspace/route structures, hotspots and weak signals. ASMT has operational detection capabilities through both internal modules (SMI, and Quasi SMI, Altitude Deviation, Airspace Infringement, Time to Conflict, MAGA – Missed Approach Gop Around, EMS – Extended Minima Separation) and external modules based on safety nets (STCA, MSAW, APW, ACAS-RA). ASMT's user-friendly features provide a complete picture of all safety-related events occurring in a local airspace. It automatically records and stores relevant data in order to build a customised dashboard, replay events and allows the export of data for further statistical analysis.

ASMT delivers immediate benefits by providing ANSPs with essential information for safety-related decision-making, through the systematic gathering and storage of safety data.

For more information: www.skybrary.aero/index.php/Automatic_Safety_Monitoring_Tool_(ASMT)

Beneficiaries ANSPs

Availability Worldwide

Product code 2P0202

3 Operational Safety

Service/tool description

As EUROCONTROL Network Manager, we contribute to safety management and operational safety across the network by identifying network safety issues (using SAFMAP - safety functions maps analysis methodology), setting related action plans to reduce risks, monitoring progress in their implementation and providing implementation support. Our ultimate goal is to achieve a harmonised approach to managing new safety risks.

Through this activity, we help our stakeholders mitigate existing hazards and anticipating new operational risks at the network level. Our ultimate goal is to keep the network safe while increasing its capacity and efficiency.

For more information:
www.eurocontrol.int/project/operational-safety-priorities

Beneficiaries ANSPs, CAAs

Availability Worldwide

Product code 2P0203

4 Compliance and Regulation Management Application (CARMA)

Service/tool description

The CARMA suite consists of two applications

- **CARMA (Compliance and Regulation Management Application)** for both Service Providers and CARMA for Competent Authorities who need to comply with ATM/ANS and ADR Regulation. It includes workflows for audit management, compliance matrices and CAPs. In addition, there is a BI Dashboard available for reporting and monitoring purposes.
- **ARM (Aviation Regulation Management)** provides a database with a central facility maintained by EUROCONTROL and national facility for users to add local regulations/procedures relevant for compliance. ARM is available both as standalone to view regulations populated in ARM and embedded within CARMA SP and CARMA CA versions.

For more information: www.eurocontrol.int/tool/carma

Beneficiaries ANSPS, Met Providers, Airports, CAAs/NSAs

Availability Worldwide

Product code 2P0204

5 Safety Culture Questionnaire (SCQ)

Description

The SCQ is a set of statements that respondents are asked to agree or disagree with by marking their choice on a five-point scale. The statements are divided into 4 sections; a general section for everyone, one section for controllers, another for technical staff (engineers, technicians and maintenance support) and a third set for managers. Two open-ended questions are included to collect further comments on the questionnaire itself and other relevant issues that personnel feel have not been covered by the questionnaire. The questionnaire is designed to elicit responses on a variety of topics that indicate how the ANSP approaches and manages safety in practice.

For more information: **www.eurocontrol.int/safety**

Beneficiaries ANSPs

Availability Worldwide

Product code 2P0205

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6 Safety Assessment Methodology (SAM)

Description

SAM is a framework, a toolbox, containing methods and techniques to develop safety assessments of changes to functional systems.

SAM allows users to perform:

- FHA (identify hazards, assess their effects and the related severity);
- PSSA (fault tree analysis, event tree analysis, common cause analysis, etc.);
- SSA (documentation of the evidence, collecting data, test and validation, etc.).

SAM is organised in three levels:

- level 1 explains the "what";
- level 2 provides details on "how" to perform a safety assessment;
- level 3 provides real life examples from air navigation service providers and the industry.

SAM has an electronic version - e-SAM - that allows users to navigate through the various documents of the regulatory framework. It works on all MS-Windows platforms.

Although there have been many changes in the regulatory framework (successively EU 2096/2005 and CIR.1035/2011), SAM is still relevant for risk assessment and mitigation purposes.

For more information:
www.eurocontrol.int/tool/safety-assessment-methodology

Beneficiaries ANSPs, CAAs, Industry Manufacturers

Availability Worldwide

Product code 2P0206

7 Call-Sign Similarity Tool (CSST)

Description

The use of similar call signs by aircraft operating in the same area on the same radio frequency is referred to as 'call sign similarity'.

The danger of a pilot taking and acting on a clearance intended for another aircraft due to this phenomenon is a common occurrence and can lead to flight safety incidents.

The purpose of the call sign similarity tool is to help aircraft operators to de-conflict similar call signs embedded in their schedules.

This helps to reduce the incidence of call sign confusion events and improves the safety of the Network.

More details on the CSST, the service levels and similarity rules can be found at: www.eurocontrol.int/service/call-sign-similarity-service

Beneficiaries ANSPs, Airports, Airspace Users, Military Stakeholders

Availability Service is available to ECAC region but could be extended worldwide

Product code 2P0207

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3// DIGITALISATION AND INFORMATION MANAGEMENT

Learn more about our activities here:

www.eurocontrol.int/digitalisation-and-information-management

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1 Business-to-Business (B2B) Web Services

Description

The business-to-business (B2B) Data services enable the automatic exchange of digital information supporting network-wide collaborative processes, as they integrate them seamlessly with local processes.

The interface provided by the Network Management Directorate gives system-to-system access to NM's services and data, allowing customers to provide, retrieve and use the NM information in their own systems, depending on their business needs.

NM's B2B automatic data exchange brings several benefits, including enhanced data quality, better accuracy, more timely information, simplified processes, reduced costs and improved safety.

Moreover, the Common Pilot Projects Regulation decrees that these flight information exchanges have to be compliant with System Wide Information Management (SWIM) and the so-called Yellow Profile in the near future. The B2B Data services are an enabler for SWIM compliance.

For more information:

Network Manager business-to-business web services (NM B2B) | EUROCONTROL
www.eurocontrol.int/service/network-manager-business-business-b2b-web-services

Beneficiaries

ANSPs, airports, CFSPs and other operational stakeholders, as defined under the Network Functions Implementing Rule

Availability

Worldwide

Product code

2P0301

2 Aeronautical Data Quality (ADQ)

Description

At EUROCONTROL, we support our stakeholders in the implementation of several European Commission regulations with the aim of ensuring the availability of optimum quality aeronautical data and aeronautical information in Europe. We take specific account of changes applied to global (ICAO) and regional (EASA and EC) regulations, standards and recommended practices. We actively share our technical knowhow on the broader change process in aeronautical data exchange with a wide range of users through stakeholder meetings, workshops, training courses or events dedicated to wider audience.

For more information:
www.eurocontrol.int/service/aeronautical-data-and-information-quality

Beneficiaries ANSPs, CAAs, Others

Availability Worldwide

Product code 2P0302

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4// INFORMATION & CYBER SECURITY

Learn more about our activities here:

https://www.eurocontrol.int/digitalisation-and-information-management

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1 European AIS Database (EAD)

Description

The European aeronautical information services database (EAD) is a centralised reference database of quality-assured aeronautical information that enables users to retrieve and download AIS data in real time.

It provides instant access to the most up-to-date digital aeronautical information from the ECAC and ECAC+ areas, from Notices to Airmen (NOTAMs), pre-flight information bulletins (PIBs), briefing facility services and the AIP library.

The EAD is the world's largest aeronautical information management (AIM) system.

EAD offers:

- a reliable and cost-effective integrated AIS solution that meets user needs;
- access to real-time data of guaranteed integrity and quality;
- consistency with ICAO and EUROCONTROL standards and recommendations;
- a secure channel for a timely electronic distribution of aeronautical information;
- support to clients during their transition to the EAD;
- service availability 24h per day, 7 days per week.

For more information:
www.eurocontrol.int/service/european-ais-database

Beneficiaries ANSPs

Availability Worldwide

Product code 2P0401

2 System Wide Information Management (SWIM)

Description

SWIM enables seamless information access and interchange between all providers and users of ATM information and services. It takes information management business practices from the ICT sector, such as Service-Oriented Architecture (SOA) and the use of open standards and web technologies, and applies them to ATM.

The EUROCONTROL SWIM Specifications form the foundation for European and global SWIM implementations. Together with supporting guidance material and training, EUROCONTROL offers a suite of services to assist (candidate) providers and consumers of ATM Information Services in their implementation of SWIM-based information exchanges.

For more information:
www.eurocontrol.int/concept/system-wide-information-management

Beneficiaries ANSPs

Availability Worldwide

Product code 2P0402

3 Aeronautical Information Management (AIM)

Description

All users, including airspace users and ANSPs, need to have access to high quality and timely aeronautical information delivered in a harmonised way. EUROCONTROL offers a number of services to ensure the availability and access to aeronautical information, and supporting aeronautical information service providers in making their aeronautical information available.

In support of aeronautical information collection, processing and distribution, EUROCONTROL offers specifications and practical guidance on:

- AIXM 5.1;
- ICAO Digital Data Sets Encoding using AIXM 5.1;
- Aerodrome mapping data;
- Electronic terrain and obstacle data provision;
- Aeronautical Digital Data Management Processes and Procedures;
- Implementation of respective regulations in States, notably Commission Implementing Regulation (EU) 2017/373 (Part-AIS).

Training, workshops or generic technical advice are offered by EUROCONTROL on technical and regulatory aspects of aeronautical information service provision incl. The transition from traditional AIS to (digital) aeronautical information management (AIM) considering the evolution towards providing aeronautical information in a SWIM context.

For more information:
www.eurocontrol.int/concept/aeronautical-information-management

Beneficiaries ANSPs, Airspace Users, Others

Availability Worldwide

Product code 2P0403

4 EATM-CERT

Description

There is a growing need to protect ATM systems and services from cyber threats.

EUROCONTROL is increasingly starting to cooperate in the area of cybersecurity worldwide, sharing the European experience.

EUROCONTROL offers a set of cybersecurity services to the aviation stakeholders of our Member States (so-called constituents) provided by the EATM-CERT.

EUROCONTROL offers a suite of cybersecurity services to aviation stakeholders in its Member States (the so-called constituents) through the European Air Traffic Management Computer Emergency Response Team (EATM-CERT). These services range from the exchange of cyber information, cyber threat intelligence, alerts, and the detection of fraudulent websites—available to all constituents—to more tailored services provided on a voluntary subscription basis (e.g., credential monitoring, vulnerability assessments, etc.).

EUROCONTROL also runs workshops at national or regional levels addressing: framework evolution (technical and regulatory aspects) and training; implementation of solutions to improve protection such as Security Operations Centre (SOC), European Air Traffic Computer Emergency Response Team (EATM-CERT).

EUROCONTROL/EATM-CERT currently cooperates with entities based in non-EUROCONTROL Member States to share cyber-information for the benefit of the European aviation community (including EUROCONTROL itself).

Services are available for Member-States only. Users fill forms to access to some services (e.g. credential leak detection, vulnerability scanning, MISP). Sometimes a cooperation agreement is signed to formalise the cooperation (e.g. penetration test, sharing of sensitive information). Currently EATM-CERT services are not subject to payment by their users/constituents.

For more information: www.eurocontrol.int/cybersecurity

Beneficiaries ANSPs, Airspace Users, Airport Operators, CAAs

Availability EUROCONTROL Member States

Product code 2P0404

4 European Aviation Common PKI (EACP)

Description

The European Aviation Common PKI (EACP) is a service tailored to address the European aviation stakeholder' needs in terms of cybersecurity and to comply with the Commission Implementing Regulation (EU) 2021/116- Common Project 1 (CP1) (Family AF5.1.1). CP1 requires the creation of a Common Public Key Infrastructure (PKI), which is used in signing, emitting and maintaining certificates and revocation lists used in inter-stakeholder communication for operational purposes, and for providing interoperability between eligible stakeholders having a Local PKI.

The EACP consists of:

- procuring commercial off-the-shelf digital certificates, using a PKI provider selected via a Call For Tenders procurement procedure launched by EUROCONTROL.
- the management of PKI "interoperability" by publishing a Certificate Trust List (CTL), including the trusted Local PKIs (as an outcome of an eligibility assessment).

Procurement with a commercial PKI provider is made by/and in the name of EUROCONTROL, in accordance with its Contract Regulations, to support the provision of PKI services in order to procure digital certificates and to support the Certificate Trust List (CTL) management. EACP users can use PKI services from the same contract, under an appropriate agreement between EUROCONTROL and EACP users (users of digital certificates, CTL or Local Registration Authority (LRA).

Each EACP user pays the service commensurately with its use of the service.

For more information:
www.eurocontrol.int/project/european-aviation-common-public-key-infrastructure-eacp

Beneficiaries

ANSPs, Airspace Users, Airport Operators, CAAs, Manufacturers, Aviation Software Vendors, Militaries, Drone Operators, Aviation Service Providers.

Availability

Services are available to EUROCONTROL Member States , and potentially also to selected trusted non-Member States.

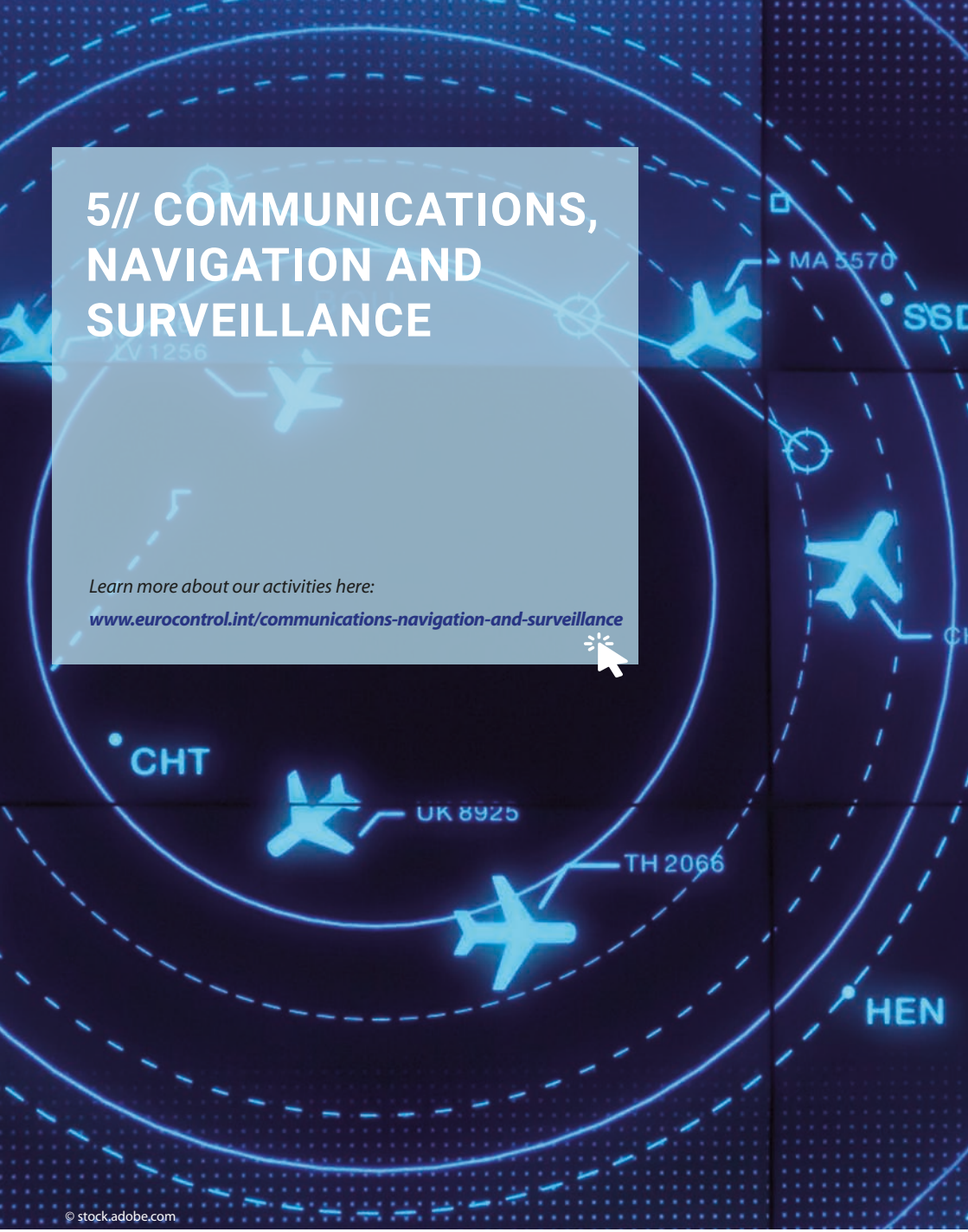
Product code

2P0405

5// COMMUNICATIONS, NAVIGATION AND SURVEILLANCE

Learn more about our activities here:

www.eurocontrol.int/communications-navigation-and-surveillance



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1 Surveillance Avionics

Description

The interoperability between airborne surveillance sub-systems and ground surveillance subsystems is a key element to achieving surveillance performance with modern independent or dependent cooperative surveillance systems. Using its experience in international surveillance Standards and a set of tools, EUROCONTROL can provide the following support:

- Verification of surveillance avionics operation against international standards and regulations;
- Verification of ground surveillance systems against international standards;
- Investigation of problems of surveillance in ground surveillance systems and in airborne surveillance systems, for example to find the causes of non-detection of aircraft and propose resolutions or mitigation plans.

Aircraft operators might consider these services to verify the correct installation of their airborne surveillance installation. Aircraft operators and manufacturers might consider these services when investigating surveillance issues. ANSPs might consider these services to resolve specific surveillance issues encountered by their surveillance systems or for the ongoing system monitoring.

For more information:
www.eurocontrol.int/function/surveillance-avionics-monitoring

Beneficiaries ANSPs, Aircraft Operators, Manufacturers, Others

Availability Worldwide

Product code 2P0501

2 ATM Surveillance Tracker and Server (ARTAS)

Description

The optimum use of all available surveillance information in an interoperable manner is a key element for safe and efficient ATM operations.

ARTAS is the well-known EUROCONTROL Surveillance Data Processing System (SDPS) that, over many years of continuous improvement, became the most deployed SDP system in Europe for both civil and military ANSPs. With millions of hours of accumulated service, it remains one of the most advanced and mature SDP systems worldwide, applying best-of-class multi-sensor tracking technology to deliver the highest level of performance using PSR, SSR, Mode-S (Elementary & Enhanced), ADS-B (both Terrestrial & Space-Based), and Multilateration surveillance sources. ARTAS is quite versatile and allows its customisation per Airspace Volume. Therefore, the same ARTAS system can perform its tracking function according to specific operational service (En-route and in the vicinity or at an airport). Not only a high performant tracker, ARTAS provides server interface to deliver customised track messages and the capability that adjacent systems can exchange their tracks to ensure smooth continuity from one site to the other.

Today, ARTAS tracks close to 90% of European daily flights at 43 air traffic control centres. In total, around 100 ARTAS units are currently deployed or are being deployed.

ARTAS is also being deployed operationally in various Non-EUROCONTROL Member States Organisations (NEMSO), such as SA, UAE, Qatar, Indonesia, Papa New Guinea and USA.

The Centralised ARTAS Maintenance and Operational Support (CAMOS) is the Support service that EUROCONTROL makes available to EUROCONTROL Member States Organisations (EMSO) for the support and the software maintenance of ARTAS.

For more information: www.eurocontrol.int/product/artas

Beneficiaries

ANSPs, ATM Operators

Availability

Product is available worldwide. Support is available for the pan-European ATM network.

Product code

2P0502

3 Surveillance Analysis Support System for ATC Centers (SASS-C)

Description

The Surveillance Analysis Support System for ATC Centres (SASS-C) is software developed, maintained and supported by EUROCONTROL. It is distributed to civil and military Air Navigation Service Providers (ANSPs), R&D organisations and the ATM industry.

SASS-C comprises 2 main functions:

The **VERIF**ication function to verify the compliance of the surveillance infrastructure with EUROCONTROL's current surveillance standards and specifications;

The **PREDICT**ion function to estimate the performance of a surveillance infrastructure, the probability of receipt of messages, the environments interference and the position measurement accuracy.

Access to the SACMAS service is granted once a proper User license has been signed between EUROCONTROL and the end-user(s).

Interface between the SACMAS service team and the User community is done throughout the iSACMAS portal for managing events, communicating and transferring files.

SASS-C is also being deployed in various Non-EUROCONTROL Member States Organisations (NEMSO), such as Canada, Qatar, Brazil, Vietnam, etc.

For more information:
www.eurocontrol.int/online-tool/surveillance-analysis-support-system-atc-centres

Beneficiaries ANSPs

Availability Worldwide

Product code 2P0503

4 Surveillance Data Distribution System (SDDS)

Description

The EUROCONTROL Surveillance Data Distribution System (SDDS) is a versatile, high-performance communications gateway that provides value-added services for the safe and secure distribution of surveillance information. SDDS enables ANSPs to exchange surveillance data in an efficient manner, contributing to the reliable and efficient operation of the pan-European ATM network.

With the objective to protect ATC system from deficient data from upstream systems that may harm it, SDDS:

- checks surveillance data for syntactic and semantic errors (deep packet filtering);
- provides firewall services;
- filters out data that may cause processing problems.

SDDS provides:

- Safety-related features including a high availability hardware platform, alternative data path selection, syntax and range checking, static and dynamic filtering
- Security-related features including a top-level architecture that separates payload and management information, as well as separation between the inter-centre and intra-centre communications
- Interoperability based on gateway functions that allow the simultaneous use of a wide variety of communication protocols.
- An ADS-B server able to process reports from multiple sensors.

Today, SDDS is used operationally in 14 air traffic control centres and many others have planned to use it operationally in the coming years.

The SDDS Implementation and Operational Support (SIMOS) is the Support service that EUROCONTROL makes available to its Member States Organisations (EMSO) for the support and software maintenance of SDDS.

For more information: www.eurocontrol.int/system/sdds

Beneficiaries ANSPs, ATM operators

Availability Product is available worldwide. Support is available for the pan-European ATM network.

Product code 2P0504

5 System Map Generator and Extractor Tool (SMGET)

Description

SMGET is used to configure the surveillance and lockout coverage (the surveillance range and lockout range, the Interrogator Code, the network address, the SAC/SIC, etc. for a stand-alone Mode S interrogators or a set of Mode S interrogators operating in a cluster) that will be used to program Mode S radar. The coverages are exported in the European Mode S (EMS) Map ICD format which can be loaded in the radar.

For more information:
www.eurocontrol.int/tool/system-map-generator-and-extractor-tool

Beneficiaries ANSPs

Availability Worldwide

Product code 2P0505

6 Distance Measuring Equipment Tracer (DEMETER)

Description

DEMETER is a software tool that supports the implementation of performance-based navigation (PBN), as well as the optimisation and rationalisation of navigation infrastructure.

The tool facilitates collaboration between airspace planners, procedure designers, navaids engineers and flight inspectors. It helps them establish Distance Measuring Equipment based positioning (DME/DME) as a continuous ground-based alternative solution to the Global Navigation Satellite System (GNSS) for PBN.

For more information:
www.eurocontrol.int/online-tool/distance-measuring-equipment-tracer

Beneficiaries

DEMETER is currently used by Air Navigation Service Providers and State entities in most EUROCONTROL Member States.

In addition, it is used globally by:

- ANSP organisations in EUROCONTROL non-Member States;
- Organisations providing flight inspection or procedure design services;
- DME transponder manufacturers;
- Universities and other educational entities.

Availability

Tool is available worldwide. Licence fees apply for organisations in non-Member States and other entities which intend to use the application for commercial purposes.

Product code

2P0506

7 EUROCONTROL Voice over Internet Protocol in ATM Test Tool (VOTER)

Description

EUROCONTROL Voice over Internet Protocol (VoIP) in ATM test tool (VOTER) is a software which provides the means to test the VoIP in ATM implementations based on Voice Communication Switches (VCS), Ground Radio Stations (GRS) and Recorders (REC) products developed according to the EUROCAE document ED-137 "Interoperability Standards for VoIP ATM".

VOTER is an essential element to facilitate timely interoperability with multi-vendor VCS, GRS and REC equipment-based VoIP implementations for Air Navigation Service Providers (ANSPs). VOTER is used worldwide.

For more information:
www.eurocontrol.int/initiative/air-traffic-management-voice
or send a mail to voipatm@eurocontrol.int

Beneficiaries

VOTER is used by industry and organisations developing VoIP systems that must be compliant with EUROCAE document ED-137.

Availability

Worldwide

Product code

1P5007

8 Aircraft Communication, Navigation and Surveillance Dashboard

Description

The CNS dashboard provides useful information in support of monitoring fleet capabilities and preparing PBN deployment plans.

The CNS dashboard provides reports and statistics on flights and aircraft with certain declared capabilities. It does so by:

Analysing Communication, Navigation and Surveillance (CNS) and Performance Based Navigation (PBN) information in the ICAO Flight Plans available to the Network Manager. Analysis can be made for different periods of time, airports, airlines or aircraft types.

Data and analysis are customised for various user profiles, including ANSPs, Airports, CAAs, Airlines, Aircraft Manufacturers, and the Public.

Despite the varied quality of declared PBN capability in Flight Plans (FPLs), the tool provides useful information in support to defining PBN deployment plans and monitoring fleet capabilities. Improvement of the data by correlation with sources of information other than FPLs is foreseen in future releases.

The CNS dashboard makes use of additional information on CNS and PBN capability declared in the ICAO Flight Plans since November 2012, when ICAO updated the FPL format with additional codes for Item 10 and 18.

For more information:
www.eurocontrol.int/dashboard/communication-navigation-and-surveillance-dashboard

Beneficiaries ANSPs, Airports, CAAs, Operators, Aircraft Manufacturers, General Public

Availability Worldwide

Product code 2P0508

9 Advanced Frequency Manager (MANIF)

Service/tool description

MANIF is an analysis tool for aeronautical frequencies. It imports Spectrum and Frequency Information Resource (SAFIRE) data and analyses frequency assignments to determine whether they comply with applicable requirements and best practices. It also supports the search for suitable frequencies to meet a request.

Access to MANIF is managed by the National Frequency Managers nominated by individual States.

For more information:
www.eurocontrol.int/function/radio-frequency-function-and-spectrum-management
For more information on MANIF:
www.eurocontrol.int/tool/advanced-frequency-manager

Beneficiaries ANSPs, CAAs, Regulators

Availability ICAO EU Region

Product code 2P0509

10 Central Register of European Radio Frequency Assignments

Service/tool description

Central Register of European Radio Frequency Assignments and the European Frequency Request Coordination System.

The Spectrum and Frequency Information Resource (SAFIRE) is a web-based system used by National Frequency Managers for the international coordination and the registration of frequency assignments in the ICAO EUR Region. Access to SAFIRE is managed by the National Frequency Managers, nominated by States and is currently limited to the Network Manager, ICAO and the users authorised by the National Frequency Managers of the ICAO EUR Region.on.

For more information:
www.eurocontrol.int/function/radio-frequency-function-and-spectrum-management
For more information on SAFIRE:
https://www.eurocontrol.int/online-tool/central-register-european-radio-frequency-assignments-and-european-frequency-request

Beneficiaries ANSPs, CAAs, Regulators

Availability ICAO EU Region

Product code 2P0510

11 Air Traffic Services Messaging Management Centre

Description

Air Traffic Services Messaging Management Centre and European Directory Services (AMC/EDS).

EUROCONTROL's Air Traffic Services (ATS) messaging management centre (AMC) provides offline network management services to support European air navigation service providers' (ANSPs) ground ATS messaging network. The offline management has been enhanced with the European Directory Service (EDS) that provides an equivalent service with more automation (automatic exchange of routing table via directory services).

The AMC/EDS also serves as the European focal point for ATS Messaging Management, and coordinates with communication and management centres in other ICAO Regions.

Learn more:
www.eurocontrol.int/tool/air-traffic-services-messaging-management-centre

Beneficiaries ANSPs

Availability ICAO EU Region

Product code 2P0511

12 European Performance-Based Navigation Portal (e-PBN)

Description

At EUROCONTROL, we have developed the e-PBN portal to provide access to a wide range of information on all aspects of performance-based navigation (PBN). In addition, we provide helpful navigation tools to the different actors involved in PBN implementation.

The portal is a great place for stakeholders implementing PBN to find technical and operational information, guidance material, PBN handbooks, navigation tools and solutions fit for their specific needs and operational environment.

This portal is provided 'as is' and aims to provide the user with comprehensive answers to the multitude of questions that the facets of PBN can create.

For more information:
www.eurocontrol.int/portal/european-performance-based-navigation-portal

Beneficiaries ANSPs

Availability Worldwide

Product code 2P0512

13 SBAS – Final Approach Segment Data Block (FAS DB)

Description

FAS DB is a web-based tool used to generate a CRC value for a SBAS-Final Approach Segment (FAS) Data Block based upon user-input data. The format and range of the entered data is validated prior to CRC calculation and the result can be copied or printed for subsequent use.

The FAS DB format and the CRC algorithm meet all the ICAO Annex 10 requirements, and the tool has been comprehensively tested using data from a number of sources including industry, the FAA and ICAO.

EUROCONTROL provides this tool to all interested parties free of charge. Access to the tool does not require authentication.

Learn more:
www.eurocontrol.int/online-tool/final-approach-segment-data-block

Beneficiaries ANSPs, Flight Procedure Organisations (FPD)

Availability Worldwide

Product code 2P0513

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14 AUGUR

Description

AUGUR is a web-based tool that checks the availability of GPS integrity (RAIM – receiver autonomous integrity monitoring) for a variety of operations, including in the terminal area and on final approaches.

Part of a pilot's duty is to check whether navigation aids will be available on their intended route and at their destination airport to ensure that navigating during the flight and on landing will be possible. This becomes more complicated if the navigation aid is orbiting in space. AUGUR tracks known satellite outages and scheduled maintenance activities and informs operators if they will have an impact on the availability of RAIM. AUGUR supports the GPS RAIM NOTAM services provided by national NOTAM offices via the EAD service desk.

For more information: www.eurocontrol.int/online-tool/augur

Over the past year, EUROCONTROL has been working on the update of AUGUR to further complement the service with additional features meeting the operational community needs. AUGUR will evolve this year towards an Integrated GNSS monitoring platform to support operational stakeholders in their planning of GNSS based operations. New functionnalities include:

- Providing the users with a graphical interface allowing to check GNSS advisories;
  - EGNOS service performances including service availability for the applicable procedures as reported by the EGNOS service provider,
  - Space weather events with potential impact on GNSS as retrieved from the ICAO space weather advisories,
  - GNSS NOTAMs issued by ANSPs announcing potential degradations of GNSS over certain areas,
  - Areas impacted by GNSS interferences as observed through ADS-B data for the previous day.
- Allowing users to register and receive customised notifications, if they wish to, indicating RAIM prediction outages or GNSS-related NOTAMs in their area of interest.

Beneficiaries Airspace Users, ANSPs, Aviation Authorities, Institutions

Availability Worldwide

Product code 2P0514

15 PEGASUS

Service/tool description

A toolset designed to help ANSPs and users evaluate the performance of satellite navigation signals in space as well as their augmentation.

PEGASUS analyses GNSS data collected from different SBAS and GBAS systems, implementing the algorithms issued in MOPS documents. This set of tools is designed to help ANSPs and users evaluate the performance of satellite navigation signals in space as well as their augmentation. PEGASUS analyses GNSS data collected from different satellite constellations (GPS, GALILEO) and augmentation systems (SBAS, GBAS, ABAS), implementing the algorithms issued in MOPS documents. This set of tools is designed to help ANSPs and users evaluate the performance of satellite navigation signals in space as well as their augmentation.

Learn more: www.eurocontrol.int/tool/pegasus

Beneficiaries ANSPs

Availability Worldwide

Product code 2P0515

16 Turn Calculator

Description

The Turn Calculator has been developed by EUROCONTROL to enable ATM specialists, including airspace planners, to visualise and comprehend the impact of aircraft turn geometry.

The user can input the aircraft, route and weather data and then to predict the turn performance. The tool computes the geometry of both the 'Fixed Radius Transition' (FRT) and 'Fly By' for the given turn angle and displays the expected earliest 'Fly By' turn as well as the FRT. The online tool also gives information on aircraft performance through the turn, including the evolution of the bank angle, calculated groundspeed and load factor.

For more information: https://pbnportal.eu/epbn/main/PBN-Tools/Turn-Calculator.html

Beneficiaries ANSPs

Availability Worldwide

Product code 2P0516

17 PBN Map Tool

Description

The EUROCONTROL Performance Based Navigation (PBN) Map Tool illustrates the deployment of PBN procedures at ECAC airports.

The airport colour code on the map indicates whether procedures are implemented or are planned to be implemented. Views provide the current deployment status as well as the status in the past and in the future. Detailed information per RWY can be accessed when clicking on an airport.

The tool also provides information related to the PBN IR (EU 1048/2018) implementation at each runway end impacted by the rule.

The tool is feature-rich, providing information on:

- deployment progress based on actual publications (according to national AIPs). The deployment of PBN approach procedures has been monitored since 2012 and since 2021 for PBN SID/STAR.
- future deployment trends based on publication plans documented in PBN Transition Plans from ATM/ANS providers.
- PBN IR implementation status.
- navigation specifications (RNAV1, RNP1, etc) and navigation sensors for PBN SID/STAR routes (GNSS, DME/DME/IRE, etc.).
- use of "Radius to Fix (RF)" in PBN SID/STAR procedures.
- PBN procedures for helicopters.
- status of conventional procedures in the TMA.

Access to the PBN map tool is free. However, users need to register to OneSky Online.

For more information: www.eurocontrol.int/platform/performance-based-navigation-map-tool

Beneficiaries

ANSPs, Airports, CAAs, Airspace Users, Policy Makers, Regulators, General Public

Availability

Worldwide

Product code

2P0517

6// AVIATION INTELLIGENCE

Learn more about our activities here:

https://www.eurocontrol.int/air-navigation-services-performance-review#governance

https://www.eurocontrol.int/forecasting

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1 Aviation Intelligence Portal

Description

The Aviation Intelligence Portal is an online portal that:

- Ensures that all stakeholders have relevant high-quality information and data on ANS performance readily available in a transparent, accurate, clear, complete and unbiased manner;
- Stimulates an informed dialogue between all stakeholders for the benefit of the entire aviation network;
- Further develops the ANS performance analysis framework and the understanding of key ANS performance issues;
- Provides a single entry point to all Aviation Intelligence data tools and publications.

The portal is public and openly accessible to all users and offers a wide range of ANS performance data for download.

For more information: https://ansperformance.eu

Beneficiaries

All aviation stakeholders

Keywords

ANS performance, ANS cost efficiency, ANS operational performance, performance data

Availability

Worldwide

Product code

2P0601

2 Air Traffic Management Cost-Effectiveness (ACE) Dashboard

Description

The ACE Dashboard provides a quick and easy access to our ATM cost-effectiveness benchmarking data.

The dashboard allows users to access the latest available data and analysis provided in the ACE benchmarking reports prepared by the EUROCONTROL Performance Review Unit. Through its interactive functionalities, it also allows users to design and customise original analyses and presentations based on ACE data.

The portal is public and openly accessible to all users.

For more information: www.eurocontrol.int/ACE/ACE-Home.html

Beneficiaries ANSPs, CAAs, Airspace Users and Others

Keywords ATM cost effectiveness, economic performance, productivity, benchmarking

Availability Worldwide

Product code 2P0602

3 Air Navigation Service Providers (ANSPs) Financial Dashboard

Service/tool description

The ANSP financial Dashboard provides a quick and easy access to aggregated financial data for selected European ANSPs.

The dashboard allows users to access the data based on the latest financial statements published by these ANSPs, and provides a high-level view on their income, balance-sheet and cash-flow statements.

The dashboard is public and openly accessible to all users.

For more information: https://ansperformance.eu/economics/finance

Beneficiaries

ANSPs, CAAs, airspace user and others

Keywords

ANSP financial statements, economic performance, ANSP balance sheets, ANSP cash-flow

Availability

Worldwide

Product code

2P0603

4 Service Unit Dashboard

Description

The Service Unit Dashboard is an interactive and intuitive online tool which allows users to explore the evolution of en-route service units in all European States part of EUROCONTROL's route charges system.

The dashboard presents different views of the monthly evolution of en-route service units. It is updated every month, a few days following the billing of airspace users, in accordance with the EUROCONTROL billing calendar.

It also provides a view per State of the current unit rates and costs and their past evolution.

The dashboard is free and open to public use.

For more information:
www.eurocontrol.int/dashboard/service-units-dashboard

Beneficiaries ANSPs, Airspace Users

Keywords En-route service units, Terminal service units, En-route unit rates and costs, Terminal unit rates and costs, charges

Availability Worldwide

Product code 2P0604

5 Airport Performance Dashboard

Description

The Aviation Intelligence Unit (AIU) Airport Performance Dashboard provides a comprehensive monthly overview of the operational performance of European airports, encompassing a wide range of indicators.

It is part of a collection of tools and dashboards available on the AIU portal, designed to monitor various aspects of airport operations.

These tools allow stakeholders to track daily traffic, continuous climb and descent operations efficiency, additional taxi times, ATFM (Air Traffic Flow Management) delays, and other key performance metrics.

The dashboard is public and openly accessible to all users.

For more information:
https://ansperformance.eu/dashboard/stakeholder/airport/db/

Beneficiaries

Airports, ANSPs, Airspace Users, CAAs

Keywords

Airport traffic, airport ATFM delay, taxi times, airport operational efficiency, punctuality, turnaround times, continuous climb and descent, airport layout, ATFM slot adherence

Availability

Worldwide

Product code

2P0605

6 Horizontal Flight Efficiency (HFE) Dashboard

Description

The HFE Dashboard, integrated into the AIU Portal, is an interactive dashboard presenting the HFE computed for three different trajectories: actual flown trajectory, planned trajectory according to the flight plan and the shortest constrained route provided by the Network Manager.

The dashboard presents the metric per State (FIR) and provides the evolution of the HFE aggregated at daily, monthly and yearly levels.

The dashboard includes also two additional metrics for the different trajectories – total additional distance flown and average additional distance flown per flight.

The dashboard is public and openly accessible to all users.

For more information: https://ansperformance.eu/efficiency/hfe/

Beneficiaries ANSPs, CAAs, Airspace Users

Keywords Horizontal flight efficiency, additional distance flown, operational efficiency, environment

Availability Worldwide

Product code 2P0606

7 Terminal Holdings (ASMA) Dashboard

Description

The Terminal Holdings (ASMA) Dashboard, integrated into the AIU Portal, is an interactive dashboard presenting the additional time in the arrival sequencing and metering area (ASMA time) for all airports providing information to the Airport Operator Data Flow (APDF).

The APDF is managed by the Performance Review Unit and supports the regular operational ANS performance monitoring under the EUROCONTROL Performance Review System.

The dashboard presents the metric per State/airport and provides the evolution of the ASMA time at daily, monthly and yearly levels.

The dashboard is public and openly accessible to all users.

For more information:
https://ansperformance.eu/efficiency/asma/

Beneficiaries Airports, Airspace Users, ANSPs

Keywords Terminal holdings, additional time in terminal area, operational efficiency, environment

Availability Worldwide

Product code 2P0607

8 Taxi-out & Taxi-in Additional Time Dashboards

Description

The Taxi-out & Taxi-in additional time Dashboards, integrated in the AIU Portal, are interactive dashboards presenting the additional taxi-out and taxi-in times for all airports providing information to the Airport Operator Data Flow (APDF).

The APDF is managed by the Performance Review Unit and supports the regular operational ANS performance monitoring under the EUROCONTROL Performance Review System.

The dashboards present the metrics per State/airport and provide the evolution of the additional taxi-out and taxi-in times at daily, monthly and yearly levels.

The dashboards are public and openly accessible to all users.

For more information: https://ansperformance.eu/efficiency/taxiout/

Beneficiaries Airports, Airspace Users, ANSPs

Keywords Unimpeded taxi times, additional taxi times, operational efficiency at airports, environment

Availability Worldwide

Product code 2P0608

9 Continuous Climb / Descent Operations (CCO/CDO) Dashboard

Description

The CDO/CCO Dashboard, integrated into the AIU Portal, is an interactive dashboard presenting the time flown level during descent at European airports.

The data is computed by the Performance Review Unit and supports the regular operational ANS performance monitoring under the EUROCONTROL Performance Review System.

The dashboard presents the metrics per State, airline and airport and provides the evolution of the performance at monthly and yearly levels.

The dashboards are public and openly accessible to all users.

For more information:
https://ansperformance.eu/efficiency/vfe/

Beneficiaries

Airports, ANSPs, Airspace Users, CAAs

Keywords

Continuous descent operations, time flown level, operational efficiency at airports, environment

Availability

Worldwide

Product code

2P0609

10 Gate-to-Gate – CO_2 Emissions Dashboard

Description

The gate-to-gate CO_2 dashboard provides users with an interactive tool to analyse the CO_2 and fuel burn within the EUROCONTROL area.

The dashboards present the metrics per network and state level and provides the evolution at daily, monthly and yearly levels. Furthermore, it is possible to analyse the data by market segment and flight phase.

The dashboard is free and open to public use.

For more information: https://ansperformance.eu/efficiency/emissions/

Beneficiaries CAAs, ANSPs, Airspace Users, Airports

Keywords CO_2 emissions, fuel burn, operational efficiency, environment

Availability Worldwide

Product code 2P0610

11 Aviation Data Repository for Research

Description

The Aviation Data Repository for Research gives researchers access to detailed datasets on aircraft trajectories and related airspace information.

The following data is available:

- detailed flight information,
- flight trajectories (planned and actual),
- airspace structure, and
- route network information.

Four representative months are provided for each year. The only condition for release is that all data must have at least a two-year delay, in accordance with agreements made with aviation stakeholders.

To access the data, users need to first register to OneSky Online.

For more information:
https://www.eurocontrol.int/dashboard/rnd-data-archive

Beneficiaries Researchers, Academia

Keywords Operational data, trajectories, flight data

Availability Worldwide

Product code 2P0611

12 Daily Traffic and Punctuality Variation Dashboard

Description

The Daily Traffic and Punctuality Variation Dashboard provides users with an interactive tool to consult the daily evolution of traffic (IFR movements) and punctuality (OTP15) for different stakeholders. It is updated daily and provides information for d-1.

For traffic there are views for Network, States, airports, aircraft operators and ACCs. For punctuality (OTP15) there are views for Network, States and airports (free access), and aircraft operators (restricted access).

The dashboard is free and open to public use (except for aircraft operator punctuality for which access is restricted).

For more information:
www.eurocontrol.int/Economics/DailyTrafficVariation-States.html

Beneficiaries CAAs, ANSPs, Airspace Users, Airports

Keywords IFR flights, departure punctuality, arrival punctuality, share of operated schedules

Availability Worldwide

Product code 2P0612

13 EUROCONTROL Data Mobile App

Description

The EUROCONTROL Data mobile app provides users with a quick access to up-to-date aviation metrics, i.e. traffic, delays, punctuality, en-route charges and CO_2 emissions into their mobile devices.

It provides views at different levels - Network, State, aircraft operator (implemented), airport and ANSP (under development). It also notifies users of weekly and ad-hoc network situation reports as well as EUROCONTROL data publications.

For each metric, aggregations at different periods are provided: day, week and year-to-date for traffic, ATFM delay and punctuality; month and year-to-date for en-route charges and CO_2 emissions. The app also shows graphical representations of the evolution of the different metrics.

The app is available at the links below:
https://play.google.com/store/apps/details?id=com.performancereviewunit.eurocontroldata&hl=en&gl=US
https://apps.apple.com/app/eurocontrol-data/id6467232405

Beneficiaries

CAAs, ANSPs, Airspace Users, Airports, Aviation Enthusiasts

Keywords

IFR flights, ATFM delays, punctuality, CO_2 emissions, en-route charges, operational performance

Availability

Worldwide

Product code

2P0613

14 Single European Sky Online Monitoring Dashboard

Description

On behalf of the European Commission, the AIU has developed a web page providing all relevant information within the Single European Sky performance scheme, including monthly operational data and meta data explaining the performance indicators.

The portal ensures that the 27 European Union Member States, Norway and Switzerland have up-to-date information on their performance with regard to the targets of the Single European Sky performance scheme.

The portal is public and openly accessible to all users.

For more information:
www.eurocontrol.int/dashboard/single-european-sky-online-monitoring-dashboard

Beneficiaries CAAs, ANSPs

Keywords SES performance scheme, IFR flights, horizontal en-route flight efficiency, continuous descents, ATFM delays, En-route service units

Availability Worldwide

Product code 2P0614

15 STATFOR Interactive Dashboard (SID)

Description

The SID is a unique source of statistics on flights in Europe.

It provides detailed and interactive visualisations of air traffic statistics and forecasts in Europe. Thanks to the segmented approach of the SID, users benefit from a customisable and flexible interface, early access to statistics – updated and made available in the first week of each month, a wide coverage of the statistics, synchronisation with the other STATFOR products.

The SID is designed to provide a standardised report structure whilst still allowing users to generate tailormade reports.

For more information:
https://www.eurocontrol.int/dashboard/statfor-interactive-dashboard

Beneficiaries

Aviation stakeholders, Airlines, ANSPs, CAAs, Airports, Students, Researchers

Keywords

STATFOR, SID, Dashboard

Availability

Eligible external and internal users can subscribe to the dashboard through EUROCONTROL OneSky Online

Product code

2P0615

16 EUROCONTROL Standard Inputs for Economic Analyses

Description

EUROCONTROL Standard Inputs for Economic Analyses provides its users with a set of values recommended to be used in economic, financial and cost-benefit analyses in the ATM and, more broadly, aviation domain.

It gathers data on different aviation-related metrics across the EUROCONTROL teams and from some external stakeholders, with the view to provide a one-stop-shop for the stakeholders that are looking for such information. Furthermore, it provides references to relevant documents and/or sites that are recommended to be consulted to obtain information on specific topics.

The document is available in an online format on the AIU Portal and is continuously being updated with new information.

For more information:
https://ansperformance.eu/economics/cba/standard-inputs/

Beneficiaries

Beneficiaries include all, public and private, stakeholders performing CBAs, financial and economic analyses in the ATM and aviation field

Keywords

Cost-benefit analysis, reference values, standard values, EUROCONTROL recommended values

Availability

Worldwide

Product code

2P0616

17 CODA Interactive Dashboard (CID)

Description

The CODA Interactive Dashboard (CID), created by the Central Office for Delay Analysis (CODA), provides a comprehensive summary of all-cause delay reasons and various derived KPIs, aggregated monthly from data supplied by airlines.

Based on The Aircraft Operator Data Flow (EUROCONTROL Specification for Operational ANS Performance Monitoring - Air Transport Operator Data Flow | EUROCONTROL) flight-by-flight data from airspace users and the Network Manager ETFMS data, this dashboard offers detailed statistics and insights into delays, including those related to ATFM and non-ATFM causes.

The dashboard is designed to provide a standardised report structure whilst still allowing users to generate tailormade reports.

For more information:
www.eurocontrol.int/dashboard/all-causes-delay-analysis-interactive-dashboard
www.eurocontrol.int/publication/eurocontrol-specification-aodf

Beneficiaries

Airlines, ANSPs, CAAs, Airports, Ground Handling, Trade Associations

Keywords

All-causes delays, punctuality, ATFM, non-ATFM delay, Weather, Delay codes

Availability

Eligible external and internal users can subscribe to the dashboard through EUROCONTROL OneSky Online.

Product code

2P0617

18 CODA Analysis Tool

Description

The CODA Analysis Tool provides a detailed access of all-cause delay reasons and various derived KPIs (e.g. taxi-, flight- and block-times) from data supplied by airlines and NM.

Data is provided by airlines on a voluntary basis as well as mandatory reporting under the SES Performance Scheme (EUROCONTROL Specification for Operational ANS Performance Monitoring - Air Transport Operator Data Flow | EUROCONTROL).

The dashboard is designed to allow airspace users a direct access to their own data as well as giving more flexibility in creating benchmark reports on ATFM and non-ATFM delays, taxi-times, flight times and block times. Benchmark reports cannot identify a third party airline, only aggregated data is made available.

For more information:
www.eurocontrol.int/publication/eurocontrol-specification-aodf

Beneficiaries

Airlines, ANSPs, CAAs, Airports, Ground Handling, Trade Associations

Keywords

All-causes delays, punctuality, ATFM, non-ATFM delay, Weather, Reactionary, taxi-time, flight time, block time

Availability

Eligible external and internal users can subscribe to the dashboard through EUROCONTROL OneSky Online

Product code

2P0618

19 MIRROR Dashboard

Description

MIRROR Gantt view creates a sequence of flights for each aircraft, its ground phases, its corresponding matched air traffic control (ATC) flight-plan, air traffic flow management (ATFM) delay and its impact on the passenger experience, enabling operational stakeholders to better predict delays and take measures to mitigate their impact – increasing the efficiency and sustainability of flights.

MIRROR also improves the situational awareness for air navigation service providers by matching the information on the submitted ATC flight plans with the airlines' commercial schedule. The data are visualised in a Gantt-chart. A series of indicators support the user assessing the current operational status.

For more information:
www.eurocontrol.int/tool/mirror

Beneficiaries

Aircraft Operators, Ground Handling, Airports, ANSPs, CAAs, Trade Associations

Keywords

All-causes-delay, airlines' schedules, schedule robustness, punctuality, reactionary delays, ATFM delays

Availability

Eligible external and internal users can subscribe to the dashboard through EUROCONTROL OneSky Online

Product code

2P0619

20 Network Punctuality Dashboard

Description

The Network Punctuality Dashboard provides the user with a live view of the operational performance of the full network, by individual airport and by individual airline.

The dashboard shows the all-causes delay and punctuality split into 6-hour blocks starting with the First Rotation phase (from 0300 UTC) to align better with commercial aviation operations.

The indicators presented can be described as follows:

- Departing/Arrival Flights are the cumulated flight plans for which NM received departure or arrival information.
- Punctuality is the percentage of flights departing or arriving 15 minutes from schedule (≤ 15 min of delay). The schedule information comes from airline or airport sources.
- Rotation Phases are operational periods on which punctuality and traffic are grouped.
- Absorption Rate of ATFM Delay (ARA) is the percentage of ATFM delay minutes not causing additional delay on arrival for the airline.
- Non-operated schedules correspond to the percentage (%) of airline schedules that did not match an operated flight (with flight plan) compared to the total number of expected flights (see diagram).

For more information: www.eurocontrol.int/tool/mirror

Beneficiaries Aircraft Operators, Ground Handling, Airports, ANSPs, CAAs, Trade Associations

Keywords All-causes delay, airline schedules, First Rotation, Knock-On delay, departure and arrival punctuality

Availability Eligible external and internal users can subscribe to the dashboard through EUROCONTROL OneSky Online

Product code 2P0620

21 Turnaround Dashboard

Description

The Turnaround Dashboard provides information about the time between in-block and off-block times of an aircraft.

Sources of information used by the Turnaround Dashboard are the consolidated flight intentions from Airport Slot Coordinators and third-party providers and ETFMS for Flight Plan derived information. The first part of the dashboard allows the user to select a series of filters to customise the information presented. More specifically, the following indicators are presented to the user:

- Scheduled, available and actual turnaround times;
- Early arrival time;
- ATFM delay;
- Net turnaround time;
- Delay difference indicator;
- Turnaround Delay Indicator;
- Ground time overshoot.

The dashboard also presents the derived results for the indicators above per airport or aircraft operator.

For more information: www.eurocontrol.int/tool/mirror

Beneficiaries

Aircraft Operators, Ground Handling, Airports, ANSPs, CAAs, Trade Associations

Keywords

All-causes-delay, airline schedules, turnaround, knock-on delay

Availability

Eligible external and internal users can subscribe to the dashboard through EUROCONTROL OneSky Online

Product code

2P0621

22 CODA Tailor-made Services and Products

Description

Requests for tailor-made solutions can be assessed on case-by-case basis to decide what the best way of support could be given while ensuring compliance with existing non-disclosure agreements and processes in place with the CODA data partners.

Beneficiaries

Aircraft Operators, Ground Handling, Airports, ANSPs, CAAs, Trade Associations

Keywords

All-causes-delay, airlines' schedules, turnaround, punctuality

Availability

Upon request to coda@eurocontrol.int

Product code

2P0622

23 ACI APN-E Dashboard

Description

Dashboard providing airport level punctuality reporting for the ACI Airport Performance Network – Europe group.

Operational data is submitted by airports on a monthly basis to the Performance Review Unit (PRU) and Central Office for Delay Analysis (CODA) of EUROCONTROL under the European Commission SES Performance Scheme. ACI EUROPE publishes monthly punctuality reports, developed by CODA on the basis of this data for APN - Europe member airports. The punctuality reports display average departure and arrival punctuality across the participating airports, as well as for each individual airport versus the APN-E average and each airport's average delay per flight (grouped by airport size). A monthly performance reporting capability is also included in the dashboard with PDF generator, which is published monthly on the ACI website.

Beneficiaries

Member Airports and Airports Council International (ACI)

Keywords

Airports, Punctuality, ACI

Availability

Restricted OneSky Online for ACI-Europe member airports.

Public Monthly Report

Product code

2P0623

24 All-Causes Delay to Air Transport in Europe Dashboard

Description

The All-Causes Delay to Air Transport in Europe dashboard can be found within the AIU portal.

The page hosts an integrated dashboard showing aggregated all-causes delay KPI's and long-term trends such as Average Delay per Flight, Departure Delay Causes breakdown and their contribution to the average delay per flight, departure and arrival punctuality by time thresholds and long departure delay trends. This is based on data received by the Central Office for Delay Analysis (CODA) within EUROCONTROL based on operational flight by flight data received from airspace users.

Available via: https://ansperformance.eu/capacity/tot_dly/

Beneficiaries Public, Airlines, Airports, Ground Handling, ANSPs, Operational Stakeholders, Research

Keywords All-Causes Delay, Airlines, Punctuality, CODA

Availability Public

Product code 2P0624

25 IATA AHM732 Delay Code App

Description

The IATA AHM732 delay code App supports the CODA work with IATA developing a new global delay code schema for qualitative delay reporting.

With the 3-layer approach new AHM732 delay code schema enhances the reporting of all-causes departure delay especially for knock-on, ATFM and weather delays. These knock-on delays typically have a strong impact on the European Network. The online version allows users for a quick and easy access point is publicly available.

Beneficiaries

Airlines, Ground handlers, Airports, Trade Associations

Keywords

All-causes delays, punctuality, ATFM, non-ATFM delay, Weather, delay codes, knock-on delay

Availability

https://iata-ahm732.azurewebsites.net/#/

Product code

2P0625

26 Open Performance Data Initiative (OPDI) Portal

Description

In 2022, the PRC launched the Open Performance Data Initiative (OPDI) with a view to establish a data platform, to support higher levels of transparency and reproducibility of performance related monitoring and associated analyses.

The platform provides open access to (summarised) flight data such as a flight list, flight events and flight measurements based on open-source ADS-B data from OpenSky Network.

For more information: https://www.opdi.aero/

Beneficiaries

Beneficiaries include all, public and private, stakeholders performing performance analysis in the ATM and aviation field.

Keywords

Open data, performance, milestones, events, measurements

Availability

Worldwide

Product code

2P0626

27 Punctuality Dashboards

Description

The Punctuality Dashboards on the ANSperformance.eu portal provide the arrival and departure punctuality (OTP15) and percentage of operated schedules per state, main EUROCONTROL airport and for the EUROCONTROL area (network view).

For more information: https://ansperformance.eu/traffic/punctuality/

Beneficiaries

Beneficiaries include all public and private stakeholders performing punctuality performance analysis in the ATM and aviation field

Keywords

Punctuality, OTP15, on-time performance, network, state, airport

Availability

Worldwide

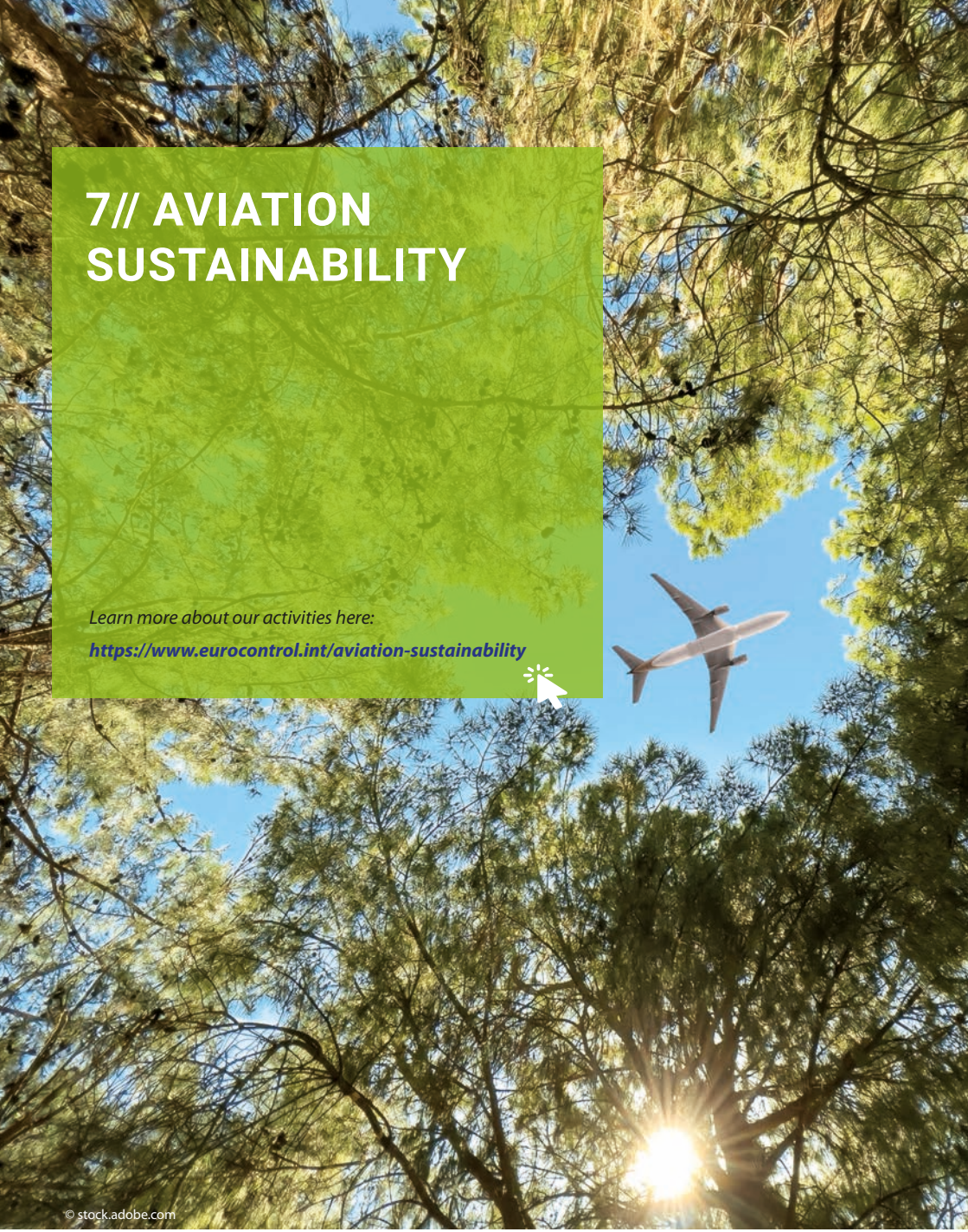
Product code

2P0627

7// AVIATION SUSTAINABILITY

Learn more about our activities here:

https://www.eurocontrol.int/aviation-sustainability



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1 Environment Management Information Service (EMIS)

Description

EUROCONTROL provides support to stakeholders to implement and comply with the EU (EEA), Swiss and UK Emissions Trading Systems (ETSs) for aviation and with ICAO's Carbon Offsetting and Reduction Scheme for International Aviation in a fair, equitable and efficient manner.

Learn more here https://www.eurocontrol.int/service/emissions-trading-system-support

The EUROCONTROL Environment Management Information Service (EMIS), which has superseded the Emission Trading Scheme Support Facility launched in 2010, delivers relevant information and data on European ETSs and CORSIA to help aircraft operators and states' competent authorities meet their regulatory obligations under these market-based measures. In the context of CORSIA, we are also interested in implementing a data exchange with non-ECAC States, offering access to data pertinent to flight/flight legs in the ECAC area.

For more information: https://www.eurocontrol.int/tool/emissions-trading-system-support-facility

Beneficiaries

Beneficiaries include different parties such as states' competent authorities in the European Economic Area (EEA) and EUROCONTROL Member States, the European Commission and aircraft operators (the regulated entities) and their accredited verifiers which can, via this service, obtain support in discharging their obligations under the European ETSs and CORSIA.

Availability

Worldwide

Product code

2P0701

2 Integrated Aircraft Noise and Emissions Modelling Platform (IMPACT)

Description

IMPACT is a web-based modelling platform, which enables the assessment of noise and fuel burn/gaseous emissions produced by aircraft operations.

IMPACT includes an aircraft performance-based trajectory calculator using the most recent versions of the ANP and BADA databases. IMPACT was thoroughly reviewed and approved by the ICAO Committee on Aviation Environmental Protection (CAEP) as one of the models suitable for supporting CAEP environmental assessments. Additionally, the IMPACT noise calculation package is compliant with ECAC-CEAC Doc29.

To maintain neutrality, we do not conduct operational studies on behalf of member states using IMPACT. We provide both access to IMPACT and technical support on the use of it (via a dedicated user support mailbox and the provision of periodic e-trainings).

For more information: **www.eurocontrol.int/platform/integrated-aircraft-noise-and-emissions-modelling-platform**

Beneficiaries ANSPs, CAAs, airspace users, industry, universities, others

Availability Worldwide

Product code 2P0702

3 Airport Local Air Quality Studies (Open-ALAQS)

Description

Open-ALAQS is a EUROCONTROL open-source tool designed to model and analyse emissions from aircraft operations and various airport sources. It is developed as a plugin for the open-source Geographic Information System QGIS, simplifying the definition of various airport emission sources (such as runways, taxiways, and buildings) and can be used to prepare emission inventories, visualise data, and perform dispersion modelling with the help of AUSTAL.

To maintain neutrality, we do not conduct operational studies on behalf of Member States using Open-ALAQS. We provide access to and training for Open-ALAQS to help you conduct local air quality studies.

For more information:
www.eurocontrol.int/online-tool/airport-local-air-quality-studies

Beneficiaries ANSPs

Availability Worldwide

Product code 2P0703

4 Advanced Emission Model (AEM)

Description

Our AEM application estimates aircraft fuel burn and emissions.

AEM can process flight profile data on a flight-by-flight basis for air traffic scenarios of almost any scope, from local studies around airports to global aircraft emissions, from gate-to-gate.

To maintain neutrality, we do not conduct operational studies on behalf of Member States using AEM. We provide access to AEM and can support you in conducting AEM assessment of aircraft emissions.

For more information:
www.eurocontrol.int/model/advanced-emission-model

Beneficiaries ANSPs

Availability Worldwide

Product code 2P0704

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5 Small Emitters Tools (SET)

Description

Our SET is an easy-to-use Excel based tool that allows to estimate the fuel burn and associated CO_2 emissions for an entire flight considering the characteristics of the air traffic covered by the Emissions Trading Systems (ETSs) of the EU (EEA), Switzerland and the United Kingdom.

The SET has been approved by the European Commission, Switzerland and the United Kingdom for use by aircraft operators in complying to the respective ETSs.

The SET relies on fuel burn models built on a statistical approach based on actual fuel burn samples of real life flights, models which thus reflect the average actual take-off mass, wind conditions, taxi times, climb/descent profile, cruise altitude, ATC, cost index, aircraft sub type variants which the sample fuel burn data relates to.

The SET therefore provides accurate estimates of the total fuel and CO_2 emissions of a set of flights based only on the ICAO type designator of the aircraft and the best estimate of the ground track distance of each flight.

The SET, however, does not provide accurate estimations of fuel burn and CO_2 of a single individual flight nor is it sensitive to changes to the actual operational characteristics of a flight (actual take-off mass, wind conditions, etc.), these not being required as inputs to perform the estimations.

The SET is updated annually and published in Q4 of each year.

For more information: **www.eurocontrol.int/tool/small-emitters-tool**

The parameters defining the equations used by the SET can be made available under a licence agreement.

For more information contact: **ets.info@eurocontrol.int**

Beneficiaries Aircraft Operators, State Authorities, Industry, Universities, Others

Availability Worldwide

Product code 2P0705

6 ContrailNet

Description

ContrailNet is an initiative to facilitate and stimulate the exchange of observation data relating to contrails. The aim of this data exchange is to support research into physical and observational models and to promote the development of validation tools.

Contact us for more information: contrailnet@eurocontrol.int

Beneficiaries Researchers on contrails

Availability Worldwide

Product code 2P0706

7 Climate Change and Adaptation

Description

At EUROCONTROL, we are taking action with, and in support of, our partners to adapt the sector to this changing environment, and to build resilience in a timely and effective manner.

Among other initiatives, we have gathered information on the range of potential climate impacts for the aviation sector to better understand the potential risks to planning, infrastructure and operations. See our 'Challenges of Growth' report for more details on potential adaptation and resilience measures.

EUROCONTROL can offer information sessions via webinars, facilitated workshops and documentation.

Beneficiaries ANSPs

Availability Worldwide

Product code 2P0707

8 Sustainable Aviation Fuels (SAF)

Description

A step further to carbon-neutrality for aviation is the usage of SAF.

SAF are:

- A clean substitute for fossil jet fuels;
- Produced from sustainable resources such as waste oils from a biological origin, agricultural residues, or non-fossil CO_2;
- Generate lower carbon emissions than conventional kerosene - by 80% when measuring their full life cycle from production to combustion;
- Compatible with current aircraft, used blended with kerosene without any need to change neither in the engines nor in the fuel supply chain at the airport.

At EUROCONTROL, we develop expertise and support for SAF uptake. We contribute to decision-making and advisory working groups regarding SAF usage.

EUROCONTROL facilitates the uptake of SAF also through contributing knowledge and expertise to stakeholder workshops. The implementation and uptake of SAF can be facilitated through the CEM Working Arrangements at airports.

EUROCONTROL can offer training, webinars on SAF and facilitated CEM Workshops.

Beneficiaries ANSPs

Availability Worldwide

Product code 1P7008

9 Collaborative Environmental Management (CEM)

Description

EUROCONTROL's CEM Working Arrangement, described in our CEM Specification, is a process that brings together the core operational stakeholders at airports (airport and aircraft operators and the ANSP) to identify the environmental impact of combined operations and to enable a coordinated response that minimises these impacts whilst maximising the airport's current and future sustainable performance. Our CEM Working Arrangements help you identify interdependencies and synergies, quantify impacts, and reach compromises on trade-offs from both an operational and environmental perspective.

Learn all about CEM, download the specifications and see our webinars on CEM implementation, facilitated workshops, training and guidance material.

For more information: www.eurocontrol.int/initiative/collaborative-environmental-management

Beneficiaries ANSPs

Availability Worldwide

Product code 2P0709

10 Continuous Descent Operations (CDO) / Continuous Climb Operations (CCO)

Description

At EUROCONTROL, we support the deployment of Continuous Climb and Descent Operations (CCOs and CDOs) - aircraft operating techniques enabled by airspace design, instrument procedure design and facilitated by air traffic control (ATC).

CCO and CDO allow aircraft to follow a flexible, optimum flight path that delivers major environmental and economic benefits - reduced fuel burn, gaseous emissions, noise and fuel costs - without any adverse effect on safety.

For more information on the CCO/CDO toolkit for implementing and delivering the performance benefits of CCO and CDO in Europe, as well as our Action Plan and much more, visit our dedicated pages:

www.eurocontrol.int/concept/continuous-climb-and-descent-operations

https://www.eurocontrol.int/airports

Beneficiaries ANSPs

Availability Worldwide

Product code 2P0710

11 FlyingGreen

Description

FlyingGreen is innovative suite of data-driven tools, services, and tailored information aimed at supporting sustainable decision-making in aviation sector and designed to assist aviation stakeholders in accelerating their transition toward sustainability, focusing on four strategic pillars: reducing emissions (NetZero), transitioning to sustainable fuels (Fuelling Decarb), building resilience to climate change (ClimAdapt), and access to green funding (DecarbFin).

As unique one-stop-shop, FlyingGreen will support ECAC Member States and the aviation sector in their efforts toward decarbonisation and climate change adaptation through its set of services.

Learn all about FlyingGreen, register for Stakeholder Consultation and Engagement Group, follow our webinars on FlyingGreen development, facilitated workshops, Use Case teasers and User manual. As of Q4 2025 training on FlyingGreen use will be offered.

For more information: www.eurocontrol.int/platform/flyinggreen
FlyingGreen platform: flying-green.eurocontrol.int

Beneficiaries States, ANSPs, Airlines, General Public

Availability Worldwide

Product code 2P0711

12 Landing & Take-Off (LTO) Emissions Estimator

Description

The main purpose of the Landing and Take-Off (LTO) cycle Emissions Estimator is to provide ECAC-wide fuel burn and emissions data for aircraft operations on the ground and in the vicinity of airports up to 3,000ft Above Ground Level (AGL) in accordance with the ICAO concept. The LTO Emissions Estimator allows users to quickly and easily access fuel burn and emissions estimations for airports in the Network Manager area.

The tool was developed to assist airport stakeholders in activities such as:

- post-operational performance assessment and monitoring;
- developing 'what-if' scenarios to assess the impact of mitigating actions;
- confidential airport benchmarking;
- support to reporting for both voluntary and legislative emissions reduction programmes.

The LTO Emissions Estimator is intended primarily for personnel of airports, ANSPs and airlines involved in processes such as Collaborative Environmental Management (CEM) or Airport Performance Management. Each user has access only to the data of his / her airport(s).

Those airport operators, which consider it appropriate, may use the tool to support reporting of CO_2 and NOx emissions to the relevant authorities. All the individual charts can be downloaded by the user for external customization and used for further analysis.

For more information: https://www.eurocontrol.int/tool/landing-and-take-cycle-emissions-estimator

Beneficiaries Various Stakeholders, mainly Airports

Availability ECAC region airports

Product code 2P0712

8// ATM STRATEGIES AND PERFORMANCE

In the context of ever-increasing complexity, the ATM Transformation service aims at supporting European aviation in making strategic decisions for the transformation of ATM.

Learn more about our activities here:

https://www.atmmasterplan.eu/ *and*

https://www.eurocontrol.int/master-plan-architecture-and-monitoring

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1 ATM Transformation

Description

Strategic planning and reporting: This involves the coordination, harmonisation and synchronisation of the wide aviation stakeholder's strategic modernisation plans to ensure consistency with the European ATM Master Plan, as well as with the International Civil Aviation Organisation's (ICAO's) Global Air Navigation Plan (GANP).

Architecture and content integration: We work with aviation stakeholders in building an integrated European ATM architecture. The reference architecture, its framework and the supporting platform are being offered as a service to ANSPs and NM for their local enterprise architecture management. It aims to support effective decision-making when using impact assessments and architectural trade-offs.

Performance and impact assessment: This activity includes the assessment of the overall performance and economic impacts of individual R&D solutions and in addition, aggregating the performance impacts at network level across the European Civil Aviation Conference (ECAC) area. The allows us to support stakeholders in selecting the innovations that best suit their performance needs.

We may participate in workshops with non-European States and ANSPs to share our experiences on the topics above. Such workshops may be tailored to the main priority areas of a given State or region.

Beneficiaries ANSPs, CAAs, Airspace Users, Airport Operators

Availability Worldwide

Product code 2P0801

9// STATE AND NSA CAPABILITIES

To assist EUROCONTROL Member States in their efforts to meet obligations and align themselves with international and European requirements. This category contains several types of established support.

Learn more about our activities here:

https://www.eurocontrol.int/customised-support-stakeholders

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1 Understanding the Impact of New Rules

Description

Advice on the development of specific amendments to primary and secondary legislation, to allow States to meet their commitments under agreements to which they are a signatory (e.g. SES, ECAA Agreement, Horizontal Aviation Agreement, etc.).

We can assist in producing a gap analysis of national legal frameworks against the relevant international and European requirements and help identify actions required to address areas of non-compliance.

Although this is not similar to the oversight activities conducted by ICAO or EASA, this can provide the State with a self-assessment to evaluate its situation and assist in the preparation for formal auditing.

Beneficiaries ANSPs, CAAs

Availability EUROCONTROL States only

Product code 2P0901

2 Support the Implementation of EU Regulations and Standards

Description

Support the implementation of the EU regulations and their Implementing Rules.

Assistance in the implementation of relevant Single European Sky (SES) legislation. This includes supporting the definition of the processes and organisational structure required in accordance with the applicable European rules. This may also cover the implementation of relevant Standards.

Beneficiaries ANSPs, CAAs

Availability EUROCONTROL States only

Product code 2P0902

3 Standardised European Rules of the Air (SERA)

Description

Support the Implementation of Standardised European Rules of the Air (SERA).

This includes supporting the definition of the processes and the organisational structure required in accordance with Commission Implementing Regulation (EU) No. 923/2012 of 26 September 2012 laying down the common rules of the air and operational provisions regarding services and procedures in air navigation (SERA).

Beneficiaries ANSPs, CAAs

Availability EUROCONTROL States only

Product code 2P0903

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4 Development of NSA Procedures

Description Assist NSAs in the development of their procedures and processes, from the planning phase, through the conduct of audit activities, to the monitoring and follow-up of corrective actions.

Beneficiaries ANSPs, CAAs

Availability EUROCONTROL States only

Product code 2P0904

5 ATM Safety Data Quality – Coding Link with ECCAIRS2

Description

Support stakeholders in the implementation of Regulation (EU) No. 376/2014 provisions, especially in the area of safety data coding and quality.

This work focusses on improving the quality of the ATM safety data transferred by the Member States to the European Central Repository within the ECCAIRS 2.0 environment, taking into account the results of the safety data coding harmonisation undertaken at European level.

Beneficiaries

ANSPs, CAAs

Availability

EUROCONTROL States only

Product code

2P0905

6 Regional Initiative Working Arrangements

Description

At the request of Regional Initiatives' governing bodies, managerial and technical assistance can be provided to established bodies (e.g. Council, NSA Coordination Committee) and working groups.

This assistance includes the development of common procedures and assisting NSAs in drafting a common NSA Handbook. The establishment of an effective pool of experts can also be facilitated by providing guidance on how to develop and establish a suitable process, including access to administrative software tools/databases.

Beneficiaries ANSPs, CAAs

Availability EUROCONTROL States only

Product code 2P0906

7 Secondment Programme

Description

The main purpose of the secondment programme is to facilitate the exchange of technical information through cooperation (including the transfer of knowledge and coaching when needed), as well as to create synergies with the support projects for the common interest of EUROCONTROL and its Member States.

It is important to note that, although the development of certain deliverables is done in cooperation with EUROCONTROL experts, the tasks of the secondment are managed by State or Regional Initiative staff in order to give them ownership of the deliverables and processes.

Beneficiaries ANSPs, CAAs

Availability EUROCONTROL States only

Product code 2P0907

10// ATS OPERATIONS

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1 Support to Terminal Manoeuvring Areas (TMAs)

Description

TMAs are often sources of significant inefficiencies (fuel, noise), in particular during peak periods.

EUROCONTROL applies the outcome of the latest research in data analysis and route design to support the improvement of TMA operations.

EUROCONTROL provides the following support:

- Characterisation of current operations (identification of best practices, potential inefficiencies and improvement areas);
- Support the design of new systematised operations (determination of requirements, design of new route structure and definition of new operating methods);
- Assess the impact of future operations (assessment of expected benefits and potential limitations using simulations);
- Monitor operations during transitions and measure evolution of performance.

More information Improving terminal operations | EUROCONTROL and Point merge | EUROCONTROL

EUROCONTROL has developed various dashboards openly accessible to all users, that may be customised.

Flight efficiency in the TMA for the top 30 airports: TMA Flight efficiency | Tableau Public

TMA explorer for some airports: TMA Explorer | Tableau Public

Point Merge interactive map with detail of procedures, all airports worldwide: Point Merge Deployment Interactive Map | Tableau Public

Control of airborne delays for CO_2 reduction, top 30 airports: Reduction of airborne delays | Tableau Public

Beneficiaries ANSPs, CAAs, Airports, Airspace Users

Availability Worldwide

Product code 2P1001

2 ATC Conflict Detection System Tuning

Description

Support to conflict detection and resolution (TP/MTCD) is sometimes ineffective due to inadequate adaptation to the uncertainty on trajectory prediction.

EUROCONTROL may provide the following support:

- Tuning of the Trajectory Prediction (aircraft performance), achieved through measurement of trajectory prediction errors and identification of anomalies and their causes;
- Detection of TP logic errors;
- Tuning of the MTCD parameters (separation parameters and prediction horizon);
- Verification of correct MTCD performance.

ANSPs might consider these services in support of system acceptance, system operational trials, safety assurance, development of the safety case, development of operational working methods and procedures and ongoing system monitoring.

Recommendations can be provided in developing the procedures and approach for the maintenance of the MTCD parameters.

Beneficiaries ANSPs, CAAs

Availability Worldwide

Product code 2P1002

3 Air/Ground Trajectory-Based Operations

Description

The proportion of CPDLC-equipped flights continues to grow and new aircraft are being delivered with an ATN-B2 capability that provides downlink of the aircraft trajectory and allows auto-load of certain clearances.

Validation exercises have shown that tactical controller workload can be reduced with the use of pre-tactical clearances enabled by Air/Ground Datalink (AGDL) and Conflict Detection and Resolution (CD&R) tools.

EUROCONTROL can demonstrate the latest research in the use of CD&R tools coupled with AGDL for the following uses:

- Coordination and uplink of route clearances to avoid segregated airspace;
- Use of CD&R tools to detect and resolve conflicts by means of a route clearance and the coordination and uplink of the clearance to the aircraft;
- Use of CD&R tools to detect conflicts involving an aircraft passing through the level[s] of other aircraft and the resolution of these conflicts through the use of complex clearances;
- Reducing controller workload through automated system proposals of conflict-free clearances (e.g. when ready descend) using CPDLC.

Beneficiaries ANSPs, CAAs

Availability Worldwide

Product code 2P1003

11// MUAC ATM DATA SERVICE PROVIDER TOOLS

EUROCONTROL's Maastricht Upper Area Control Centre (MUAC) is at the forefront of developing tools and systems to support its evolution into an ATM Data Service Provider (ADSP). This transformation is central to modernising European ATM.

Those interested in MUAC ADSP tools, from both ATS and ATFCM domains, may contact MUAC directly at:

Kristof SCHIPPERS - Product Portfolio Manager ATS;
kristof.schippers@eurocontrol.int

or Robert PARYS - Product Portfolio Manager ATFCM;
robert.parys@eurocontrol.int

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12// DRONES / UNMANNED AIR MOBILITY (UAM)

For more information:

https://www.eurocontrol.int/unmanned-aircraft-systems

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Drones / Unmanned Air Mobility (UAM)

Drone, or unmanned aircraft system (UAS), operations are becoming more frequent. Unmanned Air Mobility (UAM), air taxis, etc. are on the horizon. The vast range of possible drone applications is creating a new and expanding market where technological progress is happening very quickly. These new airspace users need to be integrated into the European airspace, not just for military purposes, but also for civil, commercial and leisure use. This integration is essential in realising the potential of this growing industry.

As the challenges of this integration can be seen from many viewpoints and creating a common understanding is essential, our goal is to maintain, with all concerned stakeholders, the "big picture" necessary for this, and to ensure that busy European skies are safe and accessible to all, with manned and unmanned aircraft operating together safely and efficiently.

EUROCONTROL shares expertise, best practices and lessons learnt in various working groups, research projects, and events worldwide. This includes such areas as drone detection systems and associated contingency procedures, operational concept and concept of operations (ConOps), common altitude reference, and conducting drone airspace assessments.

For more information: https://www.eurocontrol.int/unmanned-aircraft-systems

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1 Airspace Assessment

Description

Airspace Assessment – A key step in safely integrating drones into European airspace.

Unmanned Aircraft Systems (UAS), commonly known as drones, have the potential to transform various sectors by offering substantial economic and societal benefits. However, to fully harness these advantages, it is essential to integrate UAS into the airspace in a manner that ensures the safety and security of all airspace users.

The European Commission Implementing Regulation (EU) 2021/664 indicates that an airspace risk assessment (ARA) is required to support the designation of U-space airspace by an EU Member State.

EUROCONTROL, with the support of EASA, has developed a method to conduct such airspace risk assessments. This approach evaluates the risks associated with UAS operations in the assessed airspace and the mitigation of those risks. It forms the basis for defining UAS capabilities and performance requirements, U-space service performance requirements, and the operational conditions, airspace constraints, and other measures necessary for mitigating the risks related to the planned U-space airspace to an acceptable level. While the primary focus of these assessments is to evaluate and mitigate safety risks, such as air and ground risks, they also address security, privacy, and environmental concerns, which may require additional risk mitigation measures.

The airspace risk assessment (ARA) is a key process for the successful implementation of a U-space airspace, requiring careful planning and the participation of various stakeholders. Conducting an ARA provides essential insights into the functioning of a proposed U-space airspace.

EUROCONTROL's experts are available to assist Member States wishing to conduct a U-space airspace risk assessment.

For more information: www.eurocontrol.int/unmanned-aircraft-systems

Beneficiaries ANSPs, CAAs

Availability EUROCONTROL Member States

Product code 2P1101

2 Drone Detection & Traffic Analysis

Description

The definition and implementation of suitable processes and rules related to UAS integration into the airspace requires to rely on a sufficient volume of data/ information to insure the right decision at the right time.

Therefore, EUROCONTROL has developed the ACUTE platform where you can see where and how drones are currently flying into your airspace, facilitating your decision-making process.

The platform consists in a suite of passive sensors with limited footprint and a web-based software suite providing advanced analytics on drone traffic in a given portion of airspace (range: 15-20km radius). ACUTE is deployed at your location for a period of 6 to 9 months while statistical analytics are provided to you on a periodic basis.

A few examples of analytics provided:

- Proximity with manned aviation;
- Seasonality of flights sorted by classes (according to EASA classification);
- Max/mean altitude;
- Max/mean flying time;
- Max/mean elongation;
- Max/mean distance from remote pilots;
- Geographical density of UAS flights.

Thanks to our user-centric approach with Member States, new analytics are regularly added to the platform.

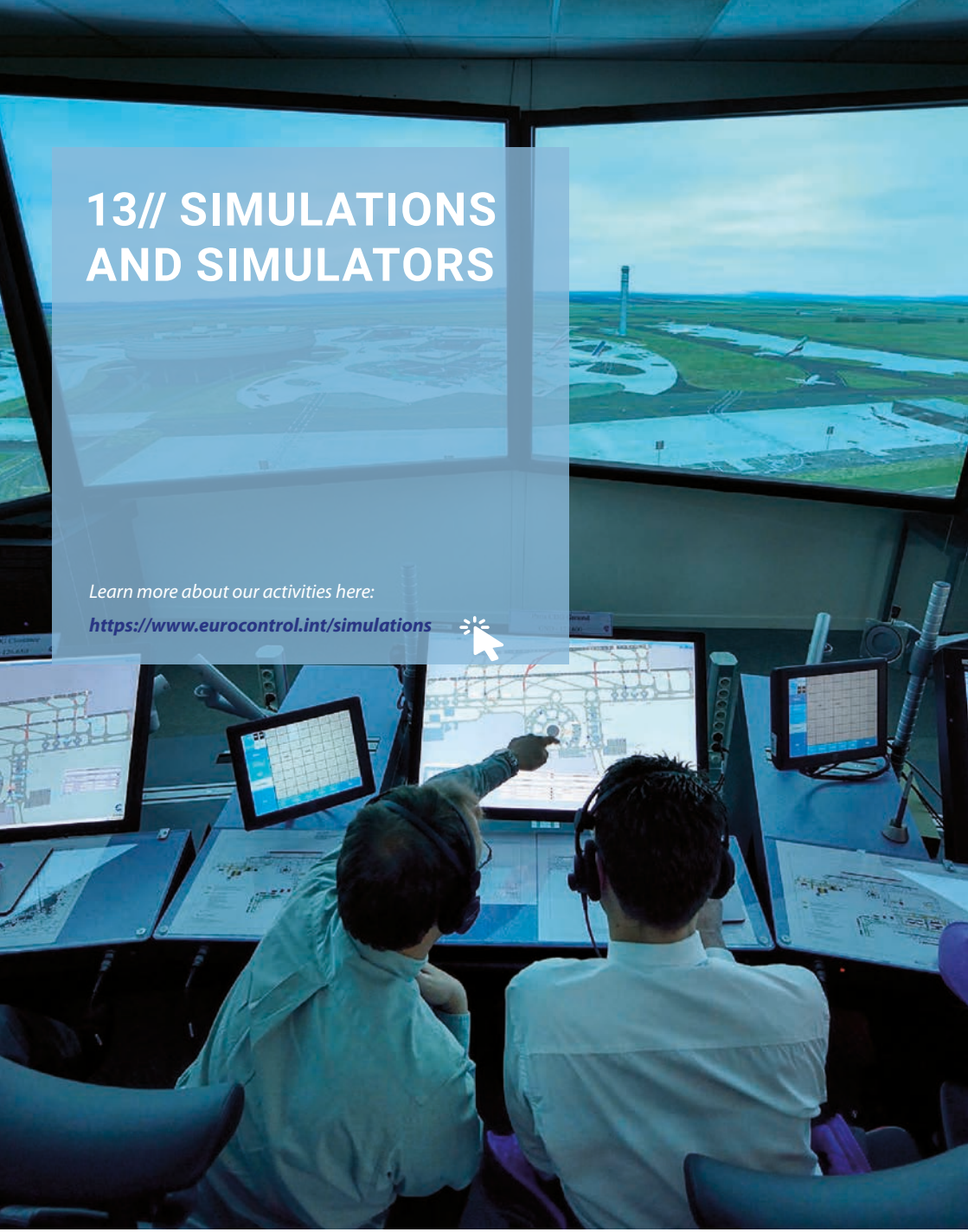
Please note, that EUROCONTROL can also connect your own drone detection antenna(s) to the platform to provide support to the data assessment.

Beneficiaries CAAs, ANSPs

Availability EUROCONTROL Member States

Product code 2P1102

13// SIMULATIONS AND SIMULATORS



Learn more about our activities here:

https://www.eurocontrol.int/simulations

1 Validation of ATM Concepts Through Simulations

Description

EUROCONTROL can validate ATM concepts, such as Free Routes, to improve network horizontal flight efficiency, or Time-Based Separation to reduce network delays through an increase in capacity.

EUROCONTROL can help analyse the benefits of a new operational concept, assess its safety impact and help building a powerful business case. With extensive support, resources and expertise from a non-profit specialist like EUROCONTROL, you can validate any concept using realistic simulations to obtain hard data.

EUROCONTROL's experienced multidisciplinary team will provide a comprehensive case-based report to demonstrate the feasibility of your project and offer recommendations for optimisation.

For more information: www.eurocontrol.int/service/validation-air-traffic-management-concepts-through-simulations

Beneficiaries ANSPs

Availability Worldwide

Product code 2P1201

2 Provision of Realistic ATC, Airport and Flow Management Systems

Description

Provision of realistic ATC, airport and flow management systems for simulations, training and research.

EUROCONTROL can help carry out an airport or airspace simulation at an R&D centre or train air traffic controllers in techniques like Time-Based Separation. Whatever kind of simulation you need to carry out, EUROCONTROL can provide you with solutions adapted to your training, validation and research needs. Drawing on over 60 years of experience in designing, developing and operating advanced ATC and Tower simulators, we have built two world-class platforms: ESCAPE for real-time en-route and approach ATC simulations; Digital Tower (based on eDEP), a digital tower simulator with our advanced Integrated Tower Working Position (iTWP).

Together, we can build an ATC/Tower simulator or training system based on your requirements and further customised with plug-ins for a full-scale simulation environment.

For network management R&D we use the Network Management Validation Platform (NMVP), a replica of the operational system, INNOVE for concepts at V2 maturity level and R-NEST a research-oriented version of the NEST tool for capacity planning and studies.

For more information: www.eurocontrol.int/service/realistic-air-traffic-control-airport-and-flow-management-systems-simulations-and-training

Beneficiaries ANSPs

Availability Worldwide

Product code 2P1202

3 Assistance for External Airspace Simulations

Description

Take your airspace simulations to the next level with expert support. Whatever simulator you are working with or for whatever purposes (training, operational or research), you may well need assistance at some point during the design, development and implementation stages.

With more than 60 years of experience developing ATM simulations and a talented multi-disciplinary team, EUROCONTROL can provide you with invaluable support to keep your project on track.

Either at our premises near Paris or on-site, we can help you from start to finish, or at any stage along the way in line with the E-OCVM:

- Running workshops;
- Drafting your validation strategy with relevant cases;
- Designing your experimental plan;
- Configuring your platform;
- Collecting data;
- Building traffic samples and airspace;
- Analysing the data collected;
- Drafting the final report.

For more information: https://www.eurocontrol.int/service/assistance-and-consultancy-external-airspace-simulations

Beneficiaries ANSPs

Availability Worldwide

Product code 2P1203

4 ESCAPE: World-Class ATC Real-Time Simulator

Description

ESCAPE is a scalable EUROCONTROL ATM real-time simulation platform supporting small- and large-scale simulations in the following areas:

- Airspace design for both en-route and TMA;
- Evaluation of new operational concepts and controller tools;
- Pre-operational validation (live trial);
- Controller training;
- Research & Development.

To foster common research with academia and research centres EUROCONTROL offers, free of charge, a light version of its real-time ATC simulator: ESCAPE Light. It can also be used for the training of students in schools and universities.

For more information: www.eurocontrol.int/simulator/escape

Beneficiaries ANSPs

Availability Worldwide

Product code 2P1204

5 Digital Tower Simulator with iTWP (integrated Tower Working Position)

Description

This real-time tower simulator is ideal for research and rapid prototyping of all possible airport related activities and concepts. It is based on our agile platform, eDEP and has already been used for the validation of several SESAR concepts and to support the implementation at airports in Europe.

Its main capabilities are A-SMGCS Airport Safety Nets for Controllers; A-SMGCS Routing function; A-SMGCS Guidance function: such as Airfield Lighting and Automated "Follow the greens"; RECAT and Time Based Separation and GBAS enabled concepts such as Adaptive Threshold and Glide Slope.

For more information:
www.eurocontrol.int/simulator/digital-tower-simulator

Beneficiaries ANSPs

Availability Worldwide

Product code 2P1205

6 Base of Aircraft Data (BADA)

Description

BADA is an aircraft performance model designed for use in aircraft trajectory simulation and prediction.

It provides theoretical model specifications and related aircraft specific datasets to realistically simulate the behaviour of any aircraft. BADA makes part of vast number of EUROCONTROL modelling and simulation tool, it is used in the NM system and provided to the ATM R&D and operational community worldwide free of charge.

For more information: www.eurocontrol.int/model/bada

Beneficiaries ANSPs

Availability Worldwide

Product code 2P1206

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7 Research Network Strategic Tool (R-NEST)

Description

R-NEST is the research version of NEST, the NM operational tool for airspace design, capacity planning and network performance assessment.
As an integrated validation tool, R-NEST combines advanced dynamic ATFCM capabilities with powerful airspace design and capacity planning analysis functionalities (including latest SESAR operational solutions). R-NEST offers powerful scenario-based modelling engine to simulate ATM network operations, detect and observe various types of delays, identify and dynamically resolve demand vs capacity imbalances over the network, use concepts such as Short-Term ATFM Measures (STAMs), create dynamic airspace sectorisation using advanced genetic algorithms and measure performance improvements of new ATM concepts on a network level.

For more information: www.eurocontrol.int/solution/rnest

Beneficiaries ANSPs

Availability Worldwide

Product code 2P1207

8 Innovative Network Operations Validation Environment (INNOVE)

Description

Innovative Network Operations Validation Environment (INNOVE) - Full-fledged Air Traffic Flow Management Real-Time Simulator.

INNOVE (Innovative Network Operations Validation Environment) is the EUROCONTROL real-time gaming platform for Network Management validations. INNOVE supports hybrid validation exercises, where either humans are in the loop or models emulate behaviours and operational processes. INNOVE's main features are rapid prototyping, scenario-based validation, time-based simulator, collaborative decision making, closed loop with ATC simulators, provides B2B services compliant with the NM operating system, connects with external platforms and tools (e.g. Airport, FOC), sharing of prototypes with the NMVP.

For more information: www.eurocontrol.int/simulator/innove

Beneficiaries ANSPs

Availability Worldwide

Product code 2P1208

9 Network Manager Validation Platform (NMVP)

Description

The EUROCONTROL NMVP is a one-to-one copy of the NM operational system. It enables very detailed and realistic network validation for operational feasibility, performance and technical assessments, interoperable with live or test ATM/Airspace users platforms (principally shadow mode trials).

For more information: www.eurocontrol.int/simulator/nmvp

Beneficiaries

ANSPs, civil and military airspace users, airports, joint civil/military airspace management cells, industrial service providers, Network Manager operational centres

Availability

Worldwide

Product code

2P1209

10 Prototyping Service

Description

In order to support its R&D programme, EUROCONTROL has a small prototyping team, building web-based ATFCM applications connected to the NM system via B2B services. This wealth of experience, gathered over 8 years, can be made available to stakeholders, to assist their own in-house developments.

This assistance typically takes the form of iteratively developed prototypes that not only consider operational needs, but equally demonstrate how to technically use and integrate the NM B2B services.

Examples of previous prototype developments include:

- Airline Slot Swapping Decision Support Tool. A tool that permitted airlines to identify slot swaps opportunities compliant with NM's operational rules and constraints. The tool was used for several years by participating airlines, whilst the equivalent functionality was integrated into the NOP portal.
- PLANTA: A prototype of an advanced ANSP Local Tool, demonstrating the most recent B2B services, giving access to NM simulations, Scenarios and Short Term ATFCM Measures. The application was used by numerous partners in SESAR validation exercises, and let to spin-off support to those ANSPs building their own in-house tools. This support allowed ANSPs to re-use parts of PLANTA's HMI look and feel, as well as technical assistance regarding B2B usage.
- Network Performance Dashboard. A prototype built in collaboration with the NM Operations Centre, demonstrating a rich network performance dashboard.

Beneficiaries ANSPs

Availability Worldwide

Product code 2P1210

14// AVIATION LEARNING CENTRE

Learn more about our activities here:

https://learningzone.eurocontrol.int/

1 Training Courses

Description

The EUROCONTROL Aviation Learning Centre in Luxembourg (ALC) offers a high number of classroom courses, virtual classroom courses, e-learning courses and webinars. ALC provides aviation training for air traffic management staff, regulators, aircraft operators, flow management personnel and aviation experts and enthusiasts. Our training includes Airspace Management, Human Performance, CNS, Information Management, Safety Management, ATM Security, Airport, Environment, Artificial Intelligence and Drones (UAS).

ALC supports EUROCONTROL pan-European activities and the implementation of the Single European Sky's efforts. ALC also contributes to the SESAR programme by delivering unique high-quality training courses such as in the areas of Network efficiency and CNS, with instructors being fully aware of latest developments through their involvement in various SESAR research or Network Management deployment programmes. Our instructors have direct access to the European Safety Programme staff and SES regulations, and some are involved in EASA standardisation visits/audits and in rule drafting.

For more information: https://learningzone.eurocontrol.int

Beneficiaries

ANSPs, Competent Authorities, Military Authorities, Airspace Users, Airports, Equipment Manufacturers, Training Organisations, Aviation Enthusiasts

Availability

Course dates are published within our online catalogue at:
https://learningzone.eurocontrol.int

Product code

2P1301

2 First European Air Traffic Controller Selection Test (FEAST)

Description

FEAST assesses the knowledge, skills and abilities of applicants for air traffic control (ATC) training that are relevant and necessary for the job of an air traffic controller.
The FEAST test battery is available worldwide to civil and military ANSPs and certified ATC aviation training academies and universities.

For more information: https://feast-info.eurocontrol.int/

Beneficiaries

Civil and military ANSPs, Training Organisations and Universities

Availability

Worldwide

Product code

2P1302

3 English Language Proficiency for Aeronautical Communication (ELPAC)

Service/tool description

ELPAC is a test to assess ICAO English Language Proficiency for pilots and air traffic controllers.
The ELAPC test is designed to help ANSPs, aircraft operators (AO), national supervisory authorities (NSA) and training organisations (TO) meet the ICAO language proficiency requirements.
ELPAC has been developed by EUROCONTROL, in partnership with the Zurich University of Applied Sciences (ZHAW) and ENOVATE.
Available to all organisations subject to signed ELPAC Licence Agreement.

More details at:
https://elpac.eurocontrol.int/docs/CR.TPL.ELPAC-Licence.pdf
For more information: https://elpac.eurocontrol.int/

Beneficiaries

Civil and military ANSPs, Approved test organisations, Competent Authorities, Training Organisations

Availability

Worldwide

Product code

2P1303

15// CIVIL-MILITARY COORDINATION

For more information:

https://www.eurocontrol.int/civil-military

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1 Flexible Use of Airspace Toolkit

Description

EUROCONTROL offers a toolkit constituted by a set of toolboxes to raise awareness of the benefits and promote the implementation of Advanced flexible use of airspace (FUA).

The objective of the FUA Toolkit is to provide a package of presentations, documents and other media to support the training of AMC personal on FUA matters, including the latest developments. The aim is to provide harmonised training material for staff involved in Airspace Management. Our toolkit helps to promote, implement and further evolve FUA. The toolkit was initially developed upon request of the International Civil Aviation Organisation (ICAO).

For more information on the FUA toolkit:
www.eurocontrol.int/tool/flexible-use-airspace-toolkit
For more information on Advanced FUA:
www.eurocontrol.int/concept/advanced-flexible-use-airspace

Beneficiaries ANSPs

Availability The toolkit is available to users upon request

Product code 2P1401

2 Local and Sub-regional Airspace Management Support System (LARA)

Description

LARA is a software package developed by EUROCONTROL and provided free of charge to ECAC States. LARA supports and enhances the airspace management process according to advanced flexible use of airspace (AFUA) principles. This enables collaborative decision-making and provides live situational awareness to civil and military partners to:

- Automate the national airspace planning, cooperative decision making and cross-boder operations related to ASM;
- Deliver the airspace status at all times ensuring common situation awareness;
- Enable ASM and ATC system connection for the tactical phase (airspace activation/deactivation);
- Provide ASM/SWIM compliant interface to support CP1;
- Collect all airspace management data for performance measurement.

For more information: **https://www.eurocontrol.int/software/local-and-sub-regional-airspace-management-support-system**

Beneficiaries ANSPs, Military

Availability Worldwide

Product code 2P1402

3 Civil-Military ATM Coordination Tool (CIMACT)

Service/tool description

CIMACT produces a correlated Air Traffic Control (ATC) picture by processing a wide variety of surveillance, flight plan and coordination data. The system provides tools, filters and safety nets found in modern Air Traffic Management and Air Defence systems and runs on standard off-the-shelf hardware.

CIMACT is being developed and maintained by EUROCONTROL to improve situational awareness of civil and military control units and facilitating the exchange between civil and military systems, thereby increasing safety and efficiency of air navigation.

CIMACT interfaces seamlessly with LARA (Local and sub-Regional Airspace Management Support System) to safely and efficiently handle airspace activations and deactivations in accordance with SWIM Standards.

CIMACT complies with the ATM Security Management document developed by the NATO-EUCOCONTROL ATM Security Coordination Group (NEASCOG).

NATO supports ATM security activities in the context of the Regional Airspace Security Program (RASP) sponsored by NATO.

For more information: **www.eurocontrol.int/tool/civil-military-air-traffic-management-coordination-tool**

Beneficiaries ANSPs, Military

Availability Worldwide

Product code 2P1403

4 PRISMIL

Description

The Pan European Repository of Information Supporting Civil – Military (PRISMIL) performance indicators:

- Collect data provided by the national ASM system, mostly via LARA. A specific LARA-PRISMIL interface extracts the data in order to fit the PRISMIL indicators;
- Pre-built indicators based on the national data collected combined with AUP, UUP and civil traffic to assess the management of the airspaces conform to FUA at three levels, strategic, pre-tactic and tactic.
- Combined with heatmaps/maps to graphically visualise the air traffic in relation to the FUA concept.

PRISMIL supports civil-military to build indicators, national dashboard, reports and analysis in order to share them between civil and military parties which is in general composed by the national CAA, Defence and ANSPs.

For more information: **www.eurocontrol.int/dashboard/pan-european-repository-information-supporting-civil-military-performance-monitoring**

Beneficiaries ANSPs, Military, CAAs

Availability Worldwide

Product code 2P1404

5 Improved OAT Flight Plan (iOAT FPL) Implementation Service

Description

The iOAT FPL implementation service is provided to Member States who decide to implement iOAT flight plans for military flight operations under OAT or mixed OAT/GAT rules in national and international airspace within the European IFPZ.

It offers a range of support services including guidance materials, training materials and direct support to implement and use the new harmonised improved OAT FPL format for national and cross border operations.

The iOAT FPL implementation service supports the development of local impact assessments, provides guidelines for AIS publication and systems upgrade and simulations to ensure interoperability between national and network systems.

For more information: **https://www.eurocontrol.int/project/ioat-fpl-improved-oat-flight-plan-implementation-project**

Beneficiaries ANSPs

Availability Worldwide

Product code 2P1405

6 Civil-Military CNS Interoperability

Description

Aviation stakeholders — including Military Authorities and ATM Planners — benefit from the technical information provided by EUROCONTROL. This information supports the identification of cost-effective and mission-efficient technical and system options during research, industrialisation, planning, procurement and implementation activities in ATM and CNS. These efforts aim to enhance civil-military CNS interoperability. A wide variety of documents are available on the EUROCONTROL website proposing technical interoperability recommendations, in particular performance-based approaches and dual use re-utilisation of available military capabilities to reduce technical impact and implementation costs.

EUROCONTROL's Civil-Military CNS Interoperability Roadmap, Edition 3.0 endorsed in October 2020 by the Members of the EUROCONTROL Military ATM Board (MAB), represents a valuable repository of CNS technical information, including several proposed CNS technology migratory roadmaps and related interoperability recommendations. It is a comprehensive document that reflects extensive technical consultation efforts with a very broad range of military authorities, civil organisations and industry stakeholders.

The new edition brings the Roadmap up to date with the latest aviation technology trends (e.g. digitalisation, connectivity and automation), infrastructure developments and research results with the aim of fostering civil-military alignment with the latest ATM/CNS concepts. It proposes civil-military interoperability recommendations that States can use as inputs for their implementation decisions.

For more information: **www.eurocontrol.int/publication/civil-military-cns-interoperability-roadmap**

Beneficiaries Aircraft and Airport Operators, ANSPs, Regulators and Procurement Agencies

Availability Worldwide

Product code 2P1406

7 EUROCONTROL Technical Assistance to Military Aircraft Modernisation Programmes (ETAMP)

Description

Military aircraft operators may benefit from EUROCONTROL technical advice and guidance to support military aircraft modernisation / life extension programmes. Technical exchanges can be organised at MoD procurement / programme management / technical expert level.

The support is available to be directly provided by EUROCONTROL military CNS experts, in close coordination with civil experts from Agency specific (civil) technical domains as appropriate. The support provided by the Agency remains within the scope of recognised ATM/CNS requirements impacting civil-military interoperability, as defined in existing regulations, standards and guidance materials. The technical advice made available for the benefit of such military aircraft programmes comprises the full set of ATM-related equipage requirements (VHF/8.33, Mode S, ADS-B, Data Link, ACAS, RVSM, PBN, etc.).

A repository of avionics requirement information for civil and for State aircraft is maintained on the EUROCONTROL website:
www.eurocontrol.int/publication/avionics-requirements-civil-and-state-aircraft

Additional aspects that military programme managers do consider in their equipage decisions are: the identification of transition arrangements to accommodate aircraft that are not equipped, opportunities for performance equivalence, operational relevance for military missions and consistency with emerging SESAR concepts as well as cost considerations.

Beneficiaries Military planners and Procurement Agencies

Availability EUROCONTROL Member States

Product code 2P1407

8 GNSS Radio Frequency Interference Testing (GRIT)

Description

The GNSS Radio Frequency Testing (GRIT) is a software developed by EUROCONTROL to support civil and military organisations in the management of Global Navigation Satellite System (GNSS) interference testing exercises.

This enables collaborative decision-making, awareness of GNSS exercises to civil and military partners and reduction of their uncoordinated impact on aircraft operations.

The tool helps ensure safety of operations by enabling:

- Accurate design of GNSS jamming and spoofing events;
- Impact assessments on aircraft operations based on the airspace areas and structures, and navigation and surveillance infrastructure in place;
- Workflow with roles and responsibilities of State entities for a interference testing decision-making process;
- Cross-border coordination among States;
- Automated generation of publication proposals (NOTAM and/or AIP SUP);
- Implementation of the EUROCONTROL guidelines on coordinating civil and military GNSS interference testing.

Beneficiaries Civil and military ANSPs, Competent Authorities, National Security Authority, National Radio Regulator, Airspace Users, and Airport Operators

Availability Worldwide

Product code 2P1408

16// CENTRAL ROUTE CHARGE OFFICE

Learn more about our activities here:

https://www.eurocontrol.int/crco

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1 Terminal Navigation Charges

Description

EUROCONTROL offers a comprehensive package of services comprising:

- Billing of terminal navigation charges, i.e.:
  - Calculation of charges on a per flight basis – (tariffs per group of aerodromes for terminal charges);
  - Preparation and dispatch of billing documents including e-billing services;
  - Processing of airlines'/airspace users' claims;
  - Provision of information on tariffs and charges billed to airlines/airspace users.
- Collection of charges (excluding enforced recovery);
- Accounting services;
- Reporting on accounting, billing and debt recovery;
- Treasury management services, i.e.:
  - Low-risk short term deposits of funds collected;
  - Weekly disbursement of funds collected to the beneficiaries designated by the State;
- Provision of information and advice in view of enforced recovery actions to be taken by the State or its air navigation service provider.

ADVANTAGES:

1. Extensive experience and expertise made available for the provision of billing and collection services;
2. Use of the advanced database on aircraft and operators that EUROCONTROL maintains for the Multilateral Route Charges System;
3. Comprehensive, clear, regular reporting on accounting, billing and debt recovery;
4. High recovery rate typically 99%+, thereby securing a stable cash flow;
5. Low collection costs typically less than 0.5% of the amounts billed, as a result of economies of scale.

Billing and collection services can rapidly become operational with minimal procedural and technical arrangements.

For more information: www.eurocontrol.int/crco

Beneficiaries

CAAs and ANSPs

Availability

These services are available worldwide and are offered on the basis of bilateral agreements

Product code

2P1501

2 Route Charges

Description

EUROCONTROL offers a comprehensive package of services comprising:

- Billing of air navigation charges, i.e.:
  - Calculation of charges on a per flight basis – (tariffs per group of aerodromes for terminal charges);
  - Preparation and dispatch of billing documents including e-billing services;
  - Processing of airlines'/airspace users' claims;
  - Provision of information on tariffs and charges billed to airlines/airspace users.
- Collection of charges (excluding enforced recovery);
- Accounting services;
- Reporting on accounting, billing and debt recovery;
- Treasury management services, i.e.:
  - Low-risk short term deposits of funds collected;
  - Weekly disbursement of funds collected to the beneficiaries designated by the State;
- Provision of information and advice in view of enforced recovery actions to be taken by the State or its air navigation service provider.

ADVANTAGES:

1. Extensive experience and expertise made available for the provision of billing and collection services;
2. Comprehensive, clear, regular reporting on accounting, billing and debt recovery;
3. High recovery rate typically 99%+, thereby securing a stable cash flow;
4. Low collection costs typically less than 0.5% of the amounts billed, as a result of economies of scale.

Billing and collection services can rapidly become operational with minimal procedural and technical arrangements..

For more information: www.eurocontrol.int/crco

Beneficiaries

CAAs and ANSPs

Availability

These services are available worldwide and are offered on the basis of bilateral agreements

Product code

2P1502

17// EUROCONTROL ON-REQUEST CONSULTANCY

Learn more about our activities here:

https://www.eurocontrol.int/about-us

1 Integrated Consulting Services

Description

EUROCONTROL offers an integrated consulting services upon request.
Our experienced consultants are available to give the expert advice in several areas, including: Network Planning; Flight Planning; Operational Systems; Fleet Management; Project Management; Procurement; Safety Management Systems; Airspace Management; Human Performance; Communications, Navigations and Surveillance; Information Management, Sustainability, Environment, ATM Security; Airport; Artificial Intelligence and Drones.
The EUROCONTROL Team has extensive international experience in working on international projects: SESAR research, Network Management deployment programmes, European Safety Programme, EUROCONTROL pan-European activities and the implementation of the Single European Sky.

For more information: www.eurocontrol.int/about-us

Beneficiaries

ANSPs, CAAs, Airports, Universities, R&D institutions, Competent Authorities, Other Organisations

Availability

Worldwide

Product code

2P1601

ABBREVIATIONS

Abbreviations and acronyms used in this document are available on the EUROCONTROL Air Navigation Inter-site Acronym List (AIRIAL) which may be found here:

http://www.eurocontrol.int/airial/definitionListInit.do?skipLogon=true&glossaryUid=AIRIAL

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